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# THE ECONOMIC JOURNAL

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THE ECONOMIC JOURNAL

*JUNE* 1958

# CAPITAL ACCUMULATION AND THE MAINTENANCE OF FULL EMPLOYMENT

## I. Introduction

The subject of this article is a theoretical model of economic growth whose working is intended to throw light on some aspects only of the mechanism by which, when employment is already full, the supply of savings may be utilised for increasing productivity in such a way as to allow employment to remain full. Drastic simplification is necessary for three reasons:

(i) in order to compress the discussion into material for one article;
(ii) in order to make clear-cut conclusions available;
(iii) in order to focus attention on particular aspects of the problem.

No further apology will be made for imposing simplifying assumptions which imply neglect of many of the most important features of the real-world environment in which accumulation takes place.

But it may be a useful precaution to list at this stage some of the important influences which will be deliberately assumed away in the interests of brevity, clarity and focus.

(i) The effects of international trade.

(ii) Monetary effects arising from the fixing of contracts and wages in terms of money rather than in terms of consumption goods. In particular, the existence of a rentier class is ignored. (One aspect of cost-inflation will, however, be considered.)

(iii) Redistribution of income through taxation and government expenditure.

(iv) Bottlenecks arising from scarcity of *particular* grades of labour or particular materials or intermediate goods.

(v) Major errors of foresight.

(vi) Diminishing or increasing returns to scale in the economy as a whole. In particular, the limitations on the supply of land are ignored, and so are changes in the skill of the working force.

(vii) The effect of political events and other ingredients in the state of the news on the inducement to invest. In particular, we shall not

allow for the possibility that the expectation of the end of full employment, whether by stagnation or by inflation, may expedite that end.

(viii) We shall not inquire what happens once the state of full employment has come to an end.

It is probable that the model can be fairly easily modified to allow one at a time for most of these neglected influences; but for the reasons already given this will not be attempted here.

The influences which the model is intended to allow for are:

(i) The influence of: (*a*) investment; (*b*) population change; (*c*) technical progress in increasing productivity and modifying the marginal efficiency of capital.

(ii) The influence of: (*a*) the authorities; (*b*) the attitude of employers; (*c*) the marginal efficiency of capital in determining the rate of profit on capital and the profit ratio (ratio of profits to net output).

(iii) The influence of: (*a*) government policy; (*b*) the attitude of employers; (*c*) the price mechanism in allocating priorities as between different types of investment.

(iv) The influence of: (*a*) the marginal efficiency of capital; (*b*) the profit share; (*c*) the rate of profit on capital; (*d*) other restrictions on keeping the balance between total investment and savings.

(v) The efforts of wage-earners to secure a sufficient rate of growth of real wage-rates.

(vi) The need for adequate inducement to invest if stagnation crisis is to be avoided.

(vii) The influence of bias in technical progress on the rate of increase of productivity, the distribution of income and the dangers of inflation and stagnation respectively.

Particular questions on which it is hoped that a study of the model may throw light are:

(i) If the underlying influences are in some sense held constant, can the development settle down to a "dynamic equilibrium" path of growth?

(ii) If so, what conditions must be satisfied by the underlying influences?

(iii) What modifications are introduced if the conditions fluctuate?

(iv) How does bias in technical progress affect the solution?

It is clear that a careful discussion of these questions needs mathematical notation. On the other hand, a loose verbal discussion with diagrams may be more illuminating. The latter form of presentation will mainly be used except in Appendix II.

The subject matter has been arranged under the following headings:

II. Growth Rates under Conditions of Dynamic Equilibrium.
III. Conditions which May End Full Employment:
(i) Stagnation Crisis.
(ii) Inflation Crisis.
(iii) Lack of Balance between Supplies of Men and Machines.
IV. Influences Determining the Rate of Profit on Capital.
V. Unsteady Growth.
VI. Relation of Model to Those of Other Writers.
Appendix I: Definitions.
Appendix II: Mathematical Summary of the Text.
Appendix III: The Quantity of Capital.

## II. Growth Rates under Conditions of Dynamic Equilibrium

The purpose of this model is both to throw light on the conditions which must be satisfied if full employment is to be preserved and to discover what kind of growth is likely to result from various underlying conditions if full employment continues for a long time. In our model the pace of advance at any moment will largely depend on the savings which are available at full employment. But if the underlying conditions remain constant for a long time the demand for investment, as determined by the growth of population and the rate of technical progress, will also affect the rate of advance. The supply of savings available will be found to some extent to adapt itself to the demand for investment. In this section we shall investigate how the supply and demand for savings are adjusted when the underlying conditions remain unchanged for a long time: in this section we shall assume that full employment is preserved throughout the process and we shall examine the state of dynamic equilibrium which the system will reach if the underlying conditions remain constant.

We shall make use of the following assumptions and definitions, some of which are taken over from other writers.

We shall suppose that when employment is full, constant proportions $\alpha$ and $\beta$ are saved out of the two categories, profits and wages, which together constitute the value of net output $(1 > \alpha > \beta \geqslant 0)$.[1]

The savings ratio $s$ means the ratio of net savings to net output: it must be a weighted average of $\alpha$ and $\beta$ with weights $\pi$ and $1 - \pi$, where $\pi$ is the profit ratio, namely the ratio of profit to net output.

The rate of profit on capital, $r$, is defined as the ratio of the value of profits to the value of capital in the economy as a whole.

We shall suppose *all* values to be measured in money and to be deflated

[1] We thus assume the same savings function as that used by Mr Kaldor in "A Model of Economic Growth," Economic Journal, December 1957, p. 604, equation (1).

by a suitable price-index of consumption goods. They thus may be thought of as " values in terms of consumption goods." [1]

We shall suppose that in a given state of technical knowledge net output per head $Y$ depends only on the value of capital per head $K$. We shall suppose that when the value of capital per head is increased the value of net output per head will be increased also but by a less proportion. We may thus write

$$Y = f(K) \quad (Y/K > df/dK > 0) \quad . \quad . \quad . \quad . \quad (2.1)$$

For brevity we shall usually refer to $Y$, the value of net output per head, as *productivity*.

We shall also suppose that as the value of capital per head, $K$, is increased, the rate or profit on capital must fall. Thus

$$r = g(K) \quad (dg/dK < 0) \quad . \quad . \quad . \quad . \quad . \quad (2.2)$$

If we regard $K$ as a measure of the stage reached in the programme of capital accumulation, then we can illustrate the development possibilities in the given state of technical knowledge by the two curves shown in Fig. 1.

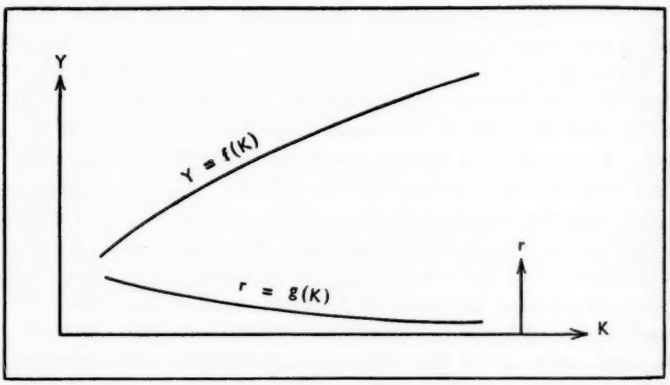


FIG. 1.—Dependence of $Y$ and $r$ on $K$.

We shall, however, find it more convenient to use as our measure of the stage of development reached, the level of the rate of profit on capital $r$: high values of $r$ will indicate an early stage of development and low values a late stage.[2] Fig. 1 can obviously be rearranged so as to show the values of productivity $Y$ and capital per head $K$ corresponding to each level of the

[1] Values per head mean values per head of the working force: similarly, " the population " and its growth rate will refer to the fully employed working force. For further explanation see Appendix II.

[2] The reader is reminded that since wages and profits are assumed to be the only forms of income, profits include interest paid on loans.

rate of profit on capital $r$. A third curve can be added showing the capital–output ratio $A$, which is defined as the ratio of the value of capital to the value of net output taken over the whole economy.

We may write these relations as

$$\Upsilon = F(r, t)\ (\partial F/\partial r < 0),\ A = G(r, t)\ (\partial G/\partial r < 0)$$
$$K = F(r, t)\ G\ (r, t) \quad . \quad . \quad (2.3)$$

The symbol $t$ is here inserted to denote that the functions relate to the state of technical knowledge at time $t$.

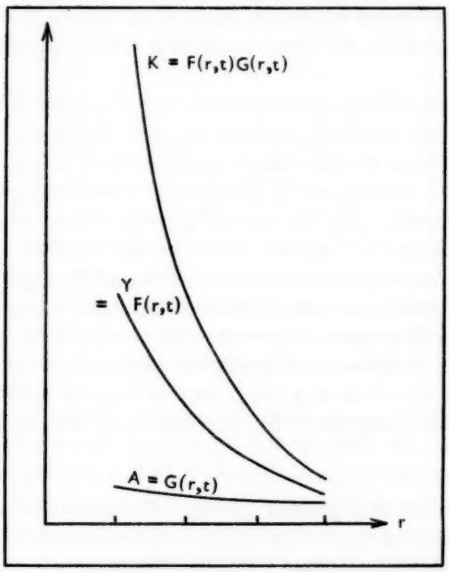


FIG. 2.—Relation of $K$, $\Upsilon$ and $A$ to $r$.

The question of how the form of the production function $\Upsilon = f(K)$ is determined is one concerning technical and engineering possibilities: we shall not inquire into this question, but will suppose this function to be given for each state of technical knowledge. The question of how the rate of profit $r$ will fall as the value of capital per head rises is, however, far more our concern. There are various alternative economic theories available to answer it, and we shall consider this question later in Section IV. Until then we shall suppose that for each state of technical knowledge we are given the relation (2.2) of the rate of profit on capital to the value of capital per head. We may then take as given the functions (2.3) illustrated in Fig. 2 above.

*Technical Progress, and Growth Rates of Population, Capital and Productivity*

Technical progress in the sense of an advance of technical knowledge will be represented by an upward movement of the curve $Y = F(r, t)$; this progress will be called neutral if the curve of $A = G(r, t)$ remains stationary as $t$ increases; it will be called labour saving if it moves upwards and capital saving if it moves downwards.

When employment is full, one of the important determinants of the rate of growth of net output is the rate of growth of capital. By this we shall mean the ratio of the value of net investment to the value of capital.[1] We assume the identity of net investment and savings, and it follows that the growth rate of capital is also the ratio of savings to the value of capital, and this can be found by dividing the savings ratio, $s$, by the capital–output ratio, $A$.

We may use our concept of the growth rate of capital in order to measure the rate of technical progress; indeed, we may define the rate of technical progress, $T$, to be that growth rate of capital which would leave the rate of profit on capital, $r$, unaffected, if population were stationary and financial policy were unaltered.[2] By the natural growth rate of capital, $N$, we shall mean that growth rate of capital which would similarly leave the rate of profit on capital $r$ unaltered, in the general case, when population may be increasing. Since under our assumption of constant returns, a growth rate of population $\gamma$ will require a growth rate of capital $\gamma$ in the absence of technical progress, if the rate of profit on capital is to be unaffected, it is easily shown that the natural growth rate of capital is obtained by adding the rate of technical progress to the population growth rate: thus

$$N = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad (2.4)$$

We shall assume that greater saving will always cause a more rapid increase in the value of capital and hence more increase in productivity and more fall in $r$. It follows that if the growth rate of capital exceeds the natural growth rate, the rate of profit $r$ will fall, whereas if it is less than the natural growth rate, then $r$ will rise. We may use this fact to establish the conditions of dynamic equilibrium.

*Dynamic Equilibrium*

We define the warranted growth rate of capital to be that growth rate which must be achieved if full employment is to be preserved. This must be given by the equation

$$W = \frac{s}{A} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2.5)$$

[1] We do *not* assume that the value of net investment is equal to the rate of increase of the value of capital.

[2] This amounts to measuring the rate of technical progress by the amount of investment in relation to the capital stock which will be needed in order to keep abreast of the progress.

where $s$ is the savings ratio at full employment. It follows from our definition of neutral technical progress that $W$ must be a fixed function of the rate of profit $r$ when technical progress is neutral.[1] So long as full employment is being preserved, the actual growth rate of capital must equal the warranted growth rate of capital, and so the rate of profit $r$ must be falling or rising according as the warranted growth rate of capital $W$ exceeds or falls short of the natural growth rate of capital $N$. We may illustrate this conclusion by means of a scissors diagram showing the curves of the warranted and natural growth rates of capital plotted against the rate of profit $r$.

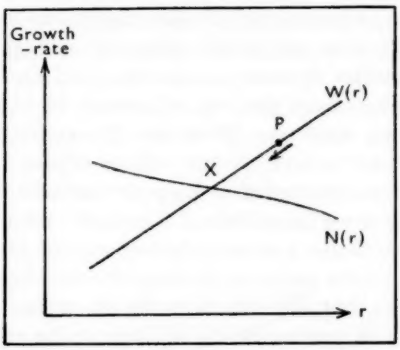


FIG. 3.—Growth-rate curves $W$ and $N$.

Provided that the warranted growth-rate curve cuts the natural growth-rate curve from below on the left, it follows that the point $P$, whose co-ordinates represent the actual rate of profit and growth rate of capital, must lie on the warranted growth-rate curve, and that it will be moving to the left or to the right according as it lies above or below the natural growth-rate curve, that is according as it lies to the right or to the left of the point of intersection $X$ of the two curves. It must therefore always be moving along the warranted growth-rate curve towards the point of intersection $X$ of the two curves.

This point $X$ may then be regarded as representing the equilibrium position of the point $P$, and provided the conditions are steady in the sense that the two curves remain fixed in position, the actual growth rate of capital and rate of profit $r$ must settle to the two values represented by the co-ordinates of the point $X$. These co-ordinates tell us in fact the growth rate of capital and the rate of profit on capital that will be reached in conditions of dynamic equilibrium. For example, if the rate of technical progress remained constant at the level $T$ and the rate of population growth remained constant at the level $\gamma$ and provided full employment was successfully maintained, the growth rate of capital would settle down to the value

[1] See equation (2.6) below.

$T + \gamma$, which is its natural rate, and the rate of profit on capital would settle to that level which would make the warranted growth rate of capital also equal to $T + \gamma$. This warranted growth rate of capital can be expressed as

$$W = s/A = \{\pi\alpha + (1 - \pi)\beta\}/A = (\alpha - \beta)r + \beta/A \quad . \quad (2.6)$$

and in this formula the coefficient $\beta$ is likely to be small. It follows that rate of profit on capital, $r$, in dynamic equilibrium must be at a level slightly less than $\frac{T + \gamma}{\alpha - \beta}$. This result to some extent confirms Mr. Kaldor's thesis that the distribution of income will be determined by the rate of technical progress at such a level as will enable adequate savings to be forthcoming and that the propensities to save out of wages and profits respectively will have very little influence on the rate of growth of capital once dynamic equilibrium has been reached. Whatever the respective propensities of workers and capitalists to save, profits will be adjusted eventually so that they will save the amount needed to keep abreast with technical progress.[1]

In the same way as we have defined a natural rate of growth of capital $N$, it is convenient to define a natural growth rate of productivity $\nu$, by the property that productivity grows at its natural rate when capital is growing at its natural rate so that the rate of profit on capital is constant.[2] This natural growth rate of productivity $\nu$ is likely to be roughly equal to the rate of technical progress, but it need not be exactly the same: we shall describe the ratio of $\nu$, the natural growth rate of productivity, to $T$, the rate of technical progress, as the technical progress coefficient $\theta$. In a given state of technical knowledge, $\theta$ may be itself a function of $r$ the rate of profit on capital. If this function remains unaltered during the process of technical advance, the rate of growth of productivity will itself settle down to the value $\theta_x T$, where $\theta_x$ denotes the value of the technical progress coefficient corresponding to the equilibrium value $r_x$ of the rate of profit on capital.

So far we have regarded dynamic equilibrium as being the process of growth which will be established eventually if full employment is preserved and if the warranted growth-rate curve and the natural growth-rate curves both remain still. Unfortunately there are no good reasons for supposing that in the real world conditions will be those which in our model would cause the two curves to remain still. The diagram showing the two curves intersecting remains a useful tool, however, even when the two curves are moving about, for it is still true then that the point $P$ will always be approaching the instantaneous position of the point of intersection of the two curves.

[1] Provided that full employment is not interrupted by inflation or stagnation crisis of the kinds discussed in Section III below.

[2] This natural rate $\nu$ may be thought of as the rate of upward movement of the curve of $\log F(r, t)$.

*Biased Progress*

An important special case is when the population growth rate and the rate of technical progress and the technical-progress coefficient all remain constant but technical progress itself is labour-saving or capital-saving. Suppose, for example, that under these conditions technical progress is labour saving, then the curve $A = G(r, t)$ will be moving upwards, and therefore the curve of the warranted growth rate of capital will be moving downwards. The point of intersection $X$ of the warranted and natural growth-rate curves will therefore be moving slowly to the right. The eventual effect of this on the point $P$, representing the current situation, must be that $P$ will lie on the moving warranted growth-rate curve just sufficiently far below the natural growth-rate line to enable it to move to the right at the same speed as the point of intersection $X$ and just behind it. In consequence, the rate of profit will be constantly increasing in dynamic equilibrium, and the distribution of income will shift continuously in

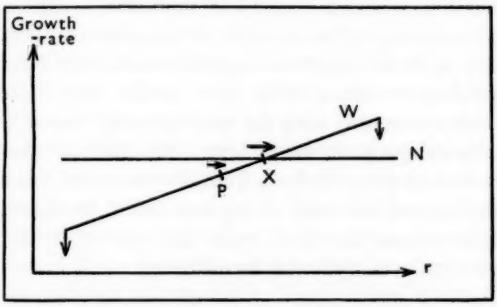


FIG. 4.—Effect of labour-saving bias.

favour of profits if labour-saving bias persists. We see also that in this case the actual growth rate of capital, which must equal the warranted growth of capital, will settle down to a level slightly less than $T + \gamma$, so that the effect of the labour-saving bias in technical progress is slightly to reduce the growth rate of capital corresponding to the state of dynamic equilibrium. It also follows with labour-saving technical progress, that since the actual growth rate of capital is always slightly less than the natural growth rate after dynamic equilibrium has been reached, the actual growth rate of productivity must be slightly less than the natural growth rate $\theta T$: the effect of the labour-saving bias is therefore to reduce the growth rate of productivity in dynamic equilibrium below the level it would have achieved with the same rate of technical progress without bias and the same technical progress coefficient and the same growth rate of population.

We may consider in the same way the effect of a labour-saving bias in

technical progress for a limited period only. If the technical-progress coefficient remains constant at the level $\theta$ and the rates of technical progress and the growth rate of population both remain constant at the levels $T$ and $\gamma$, then the effect of a labour-saving bias in progress for a limited period will be to shift the warranted growth rate of capital curve to a lower position and to leave it fixed there. The point of intersection of the two curves $X$ will therefore have moved somewhat to the right. However, if the rate of technical progress $T$ and the growth rate of population are both independent of the rate of profit on capital, $r$, the natural growth-rate curve will be a horizontal straight line and the equilibrium growth rate of capital will remain unaffected at the level $T + \gamma$: and the equilibrium growth rate of productivity will remain unaffected at the level $\theta T$. But although these equilibrium growth rates are unaffected, the profit ratio $\pi$, the rate of profit on capital $r$ and the capital–output ratio $A$ will all be higher in the state of dynamic equilibrium than they would have been if there had not been a labour-saving bias in progress for a limited period.

It is clear that the converse results will hold when there is capital-saving bias in technical progress. For example, if progress remains capital-saving the rate of growth of both capital and productivity will be somewhat raised in dynamic equilibrium above what they would have been with neutral progress at the same rate and with the same growth rate of population and value of the technical progress coefficient. Similarly, if there is a capital-saving bias in technical progress for a limited period only, this will leave the dynamic equilibrium growth rates of capital and of productivity unaffected but will somewhat reduce the profit ratio, the rate of profit on capital and the capital–output ratio in dynamic equilibrium.

*Summary of Conclusions of Section II*

Provided full employment is not ended by crisis, a constant rate of neutral technical progress $T$ and growth rate of population $\gamma$, in the face of constant savings propensities $\alpha$ and $\beta$, will lead to dynamic equilibrium with a growth rate of capital $T + \gamma$; the share of profits $\pi$ will be constant and so will $r$, rate of profit on capital: productivity and the value of capital per head will each then have the growth rate $\theta T$, where $\theta$ is the technical-progress coefficient. But if there is labour-saving bias the growth rates in dynamic equilibrium will be slightly less and the distribution of income will be constantly shifting in favour of profits: the growth rate of productivity will then be slightly less than that of the value of capital per head.

## III. Conditions Which May End Full Employment

*Stagnation Crisis*

Although we have discussed at some length what growth rates would result if dynamic equilibrium were reached, we have not yet considered what conditions must be satisfied if full employment is to be maintained until dynamic equilibrium is reached.

Of the many possible reasons why full employment may end we shall consider only three in this article:

(i) Stagnation Crisis.
(ii) Inflation Crisis.
(iii) Crisis due to lack of balance between " men " and " machines."

In the present section we shall consider only the danger of stagnation crisis. By this we mean a state of affairs when employers cannot be persuaded to undertake enough investment to keep the net investment up to the level of savings available at full employment. In order to examine the conditions for avoiding this state of affairs we need to make some assumption about the inducement to invest. There is very little reliable information about this, and a wide choice of assumptions is accordingly open to us. It seems reasonable to suppose that (at any given level of the capital–output ratio) when the average rate of profit on capital is high employers will be more ready to undertake investment than when it is low: at a given rate of profit on capital they will be more ready to invest if the profit ratio is high than if it is low. Given the rate of profit on capital and the profit ratio, there remain a variety of extraneous factors which can encourage or discourage investment. These include the financial cost of borrowing, which must discourage investment, other obstacles to borrowing, such as credit rationing, shortage of intermediate goods due to long order books and reluctance to face the risks associated with heavy borrowing.

We shall accordingly assume that there is an upper limit $m(r, \pi)$ $\frac{\partial m}{\partial \pi} > 0$ to the value of net investment in relation to that of capital (*i.e.*, to the growth rate of capital), depending on the rate of profit on capital and the profit ratio. Since $\pi = rA$, this can also be regarded as a function $M(r, A)$ of the rate of profit on capital, $r$, and of the capital–output ratio $A$ $\left(\frac{\partial M}{\partial A} > 0 \ \frac{\partial M}{\partial r} > 0\right)$. This upper limit can be achieved (given the savings) if the monetary authorities do all in their power by easy credit, etc., to encourage investment, but the growth rate of capital can be kept below this limit, and in balance with the warranted growth rate, if the authorities take steps to make investment more difficult by making credit tighter, or by imposing controls and rationing of various kinds. Such action will adjust investment and savings into equality by restraining investment and

at the same time *raising* the rate of profit on capital (including interest paid to lenders), and hence the profit ratio and the savings ratio. This assumed success of the authorities in restraining investment down to the level of full-employment savings is one of the main factors determining the form of the function $r = g(K)$, which gives the rate of profit on capital corresponding to each level of the value of capital per head $K$, in a given state of technical knowledge.

We may call this upper limit to the growth rate of capital the *maximum* growth rate of capital $M(r, A)$. In a given state of technical knowledge $M(r, A)$ is a function of $r$, namely $M\{r, G(r, t)\}$, and may be represented on

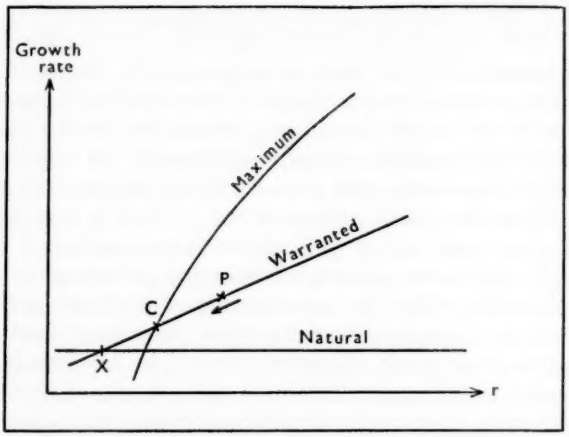


FIG. 5.—Maximum, Warranted and Natural Growth Rates.

the same diagram as the curves of natural and warranted growth rates. In Fig. 5 it is shown falling sharply to the left at the left-hand end. The idea underlying this is that if the rate of profit on capital $r$ goes on falling, a point will be reached when this rate of profit is less than can be earned on gilt-edged securities—there being a lower limit to the level to which this latter rate can be reduced. It seems unlikely that employers can be induced to invest much when this point has been passed.

Fig. 5 illustrates conveniently the conditions which determine whether stagnation crisis will arise. The three curves will in general be moving about because each of the three growth rates shown will be changing functions of $r$, the rate of profit on capital. But let us first consider the case where the three curves are fixed.[1]

The point $P$ whose co-ordinates give the actual growth rate of capital

[1] Sufficient conditions for this are that the rate of technical progress $T$ and the growth rate of population and the maximum growth rate are all fixed functions of $r$ and $A$, and that technical progress is neutral.

and rate of profit on capital will be moving to the left so long as full employment is preserved and it lies to the right of $X$, the point of intersection of the warranted and natural growth-rate curves. If it also lies to the right of $C$, the point where the maximum growth-rate curve cuts the warranted growth-rate curve, the inducement to invest can be made more than sufficient to absorb full-employment savings if the monetary and general economic policy is as encouraging as possible to investment: in order to keep the balance, some degree of credit restriction will therefore be appropriate—the exact degree depending on the gap between the maximum and warranted growth-rate curves. If, as in Fig. 5, $C$ lies to the right of $X$, then the point $P$ will eventually pass $C$, and when this happens, despite all encouragement

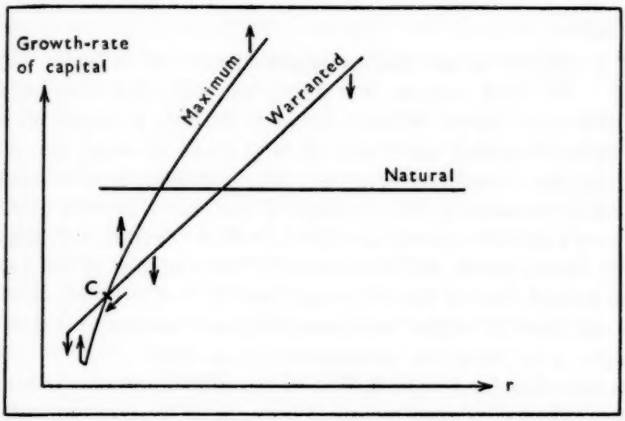


FIG. 6.—Effect of labour-saving bias on growth-rate curves.

from the authorities, investment will become insufficient to absorb the savings available at full employment: stagnation crisis will ensue.

Thus if the three curves are fixed the condition for avoiding stagnation crisis is that $X$ should lie to the right of $C$—that is that the natural growth-rate curve should pass above the point of intersection $C$ of the maximum and warranted growth-rate curves.

If the three curves are moving about, a sufficient condition is that the natural growth-rate curve should never pass below the point of intersection of the other two: a necessary and sufficient condition is that it should never do so for long enough to allow $P$ to pass the point $C$.

When the rate of technical progress, the growth rate of population, the saving-propensities $\alpha$ and $\beta$, and the investment function $M(r, A)$ are all fixed, then a labour-saving bias in technical progress will always make stagnation crisis more remote. For then the natural growth-rate curve remains fixed and horizontal, and it can be seen that the point of intersection of the two other curves moves lower down as in Fig. 6.

This can be seen by considering its effect on the three curves of growth rate of capital. The curve of the natural growth rate will be unaffected: that of the maximum growth rate will be raised (because of our assumption $\frac{\partial M}{\partial A} > 0$ and of the effect of labour-saving bias which is to increase $A$ for given $r$). The curve of the warranted growth rate of capital will fall on account of the same effect of the bias. The joint result is that the crisis point $C$ falls farther to the left and farther below the natural growth-rate curve. We see therefore that the effect of labour-saving bias is to make stagnation crisis more remote. Capital-saving bias will have the opposite effect.

*Inflation Crisis*

A full treatment of the various possible causes of inflation will not be attempted. We shall suppose that employers will always adjust prices so as to maintain the correct relation between the rate of profit on capital $r$, and the value of capital per head: at any given moment this relation is expressed by the equation $r = g(K)$. We shall assume that workers will insist on rapid increases in money-wages if the rate of growth of real wages per head ever falls below some prescribed level $\omega$. A spiral of rising money-wages and money-prices will thus result if the working of the model ever allows the growth rate of the real wage rate $(1 - \pi)\,\Upsilon$ to fall below $\omega$: we shall call this state of affairs inflation crisis, and assume that it so disrupts the economy as to bring full employment to an end.

Let us first consider a state of dynamic equilibrium with constant growth rate of population $\gamma$, neutral technical progress at the constant rate $T$, with a constant technical progress coefficient $\theta$ and with constant savings propensities $\alpha$ and $\beta$. The growth rate of productivity $\Upsilon$ will then be $\theta T$, and $\pi$ will be constant, since $r$ will be constant. The growth rate of the real-wage rate $(1 - \pi)\Upsilon$ will thus also be $\theta T$. Hence inflation crisis will be avoided provided

$$\theta T > \omega \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3.1)$$

However, if there is a labour-saving bias in technical progress the rate of growth of productivity will, we have seen, be rather less than $\theta T$, in dynamic equilibrium, and at the same time the rate of profit on capital will be increasing. The former effect will increase the danger of inflation crisis, given $T$ and $\theta$: the latter effect is likely to redistribute income in favour of profits (decreasing $1 - \pi$) and thus to increase the danger still more.

The above results relate only to the position of dynamic equilibrium. But even if this position allows the avoidance of inflation crisis, it may be impossible to reach it because inflation crisis occurs first. If technical progress is neutral and the rate and coefficient of technical progress $T$ and $\theta$, the population growth rate $\gamma$ and the savings propensities $\alpha$ and $\beta$ are

all constant, then provided the rate of profit on capital initially exceeds the equilibrium value $r_z$, the condition $\theta T > \omega$ is likely to avert inflation crisis indefinitely. For in this case the growth rate of capital will exceed the natural rate $N$, and hence the growth rate of productivity will exceed the natural growth rate $\theta T$ and *a fortiori* it will exceed $\omega$: at the same time the rate of profit on capital will be falling, and this is likely [1] to cause some redistribution of income in favour of labour (increased $1 - \pi$), and thus the growth rate of real wages will exceed the critical level $\omega$ by even more than will the growth rate of productivity.

However, the interesting case is that where with neutral technical progress $T$, $\theta$, $\alpha$, $\beta$ and $\gamma$ are all constant, but initially the equilibrium level $r_z$ of the rate of profit on capital exceeds the actual value $r$. For now the rate of profit on capital must rise, and this may cause a redistribution of income away from labour so violent as to offset the good effects of technical progress on real-wage rates.

Even in the most simple case, where both technical knowledge and population are fixed, inflation crisis can be avoided only if $\omega$ is sufficiently small. Under these circumstances the growth rate of capital will be at the warranted growth rate $W$, and this will provide a growth rate of real wages equal to a multiple $\theta'$ of $W$, where $\theta'$ may be termed *the redistributive coefficient*. (A discussion is provided at the end of Appendix II of how the redistributive coefficient depends on our other concepts.) In this simple case the growth rate of real wages being $\theta' W$, the condition for the avoidance of inflation crisis is simply

$$\omega \leqslant \theta' W \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3.2)$$

The further effects of population growth and technical progress on inflationary pressure require mathematical treatment, and this is provided in Appendix II. Population growth is inflationary (except in the extremely perverse case $\theta' < 0$), but neutral technical progress may be either inflationary or deflationary according as the good effects on productivity are or are not overwhelmed by the effect of redistributing income in favour of profits: this turns on whether the redistributive coefficient $\theta'$ is greater or less than the technical progress coefficient $\theta$. It is shown in Appendix II that with population growth at rate $\gamma$ and neutral technical progress at rate $T$, the condition (3.2) must be modified to the form (36), namely

$$\omega \leqslant \theta'(W - \gamma) + (\theta - \theta')T \quad . \quad . \quad . \quad . \quad (3.3)$$

and this places an upper limit on the rate of technical progress if $\theta' > \theta$ (the case where its effect is to increase inflationary pressure); but if $\theta' < \theta$, then the condition places a lower limit on the rate of technical progress; provided $W > \gamma$, however, this lower limit will be negative.

[1] This, however, is not strictly necessary under our assumptions. A perverse case can arise in which the capital–output ratio rises so fast when $r$ falls as to cause redistribution in favour of profits.

The effect of labour-saving bias is shown always to be inflationary, both *en route* to dynamic equilibrium and after it has been reached. Conversely, capital-saving bias reduces inflationary pressure. These results presume that the rate of technical progress $T$ and the coefficients $\theta$, $\theta'$, $\alpha$, $\beta$ and $\gamma$ are all given.

*Crisis Due to Lack of Balance Between Men and Machines*

Let us assume that the rates of interest on loans and other deterrents and controls on investment are just sufficient to keep the total volume of net investment in balance with the savings available at full employment. Can we then expect the " total number of machines " to remain in proper balance with the number of workers available to use them?

It is not widely misleading to think of the requirements for gross investment as falling into the following categories:

($a_1$) replacement of machines which have come to the end of their life by new machines of the same type;

($b$) adding to the number of machines of an existing type in order to cope with expanding demand;

($a_2$) replacement of machines which have come to the end of their life by a more modern and efficient type;

($c$) introducing machines to carry out processes which have previously been carried out by labour alone.

It is clear that if investment were only devoted to types ($a_1$) and ($b$) there would be great danger of creating over-capacity in the sense that there would be machines standing idle without workers to use them. At the opposite extreme, if all investment were devoted to type ($c$), there would develop a great strain on the available machines, so that in order to preserve full employment, it would become necessary to keep in use some machines which would normally have been scrapped and to work others with two or three shifts which would normally only have been worked with one.

But any tendency towards either of these errors would produce its own corrective, provided the interest rates and other deterrents were functioning so as to maintain the correct total of net investment. For if a surplus of capacity began to appear investment of types ($a_1$) and ($b$) would become far less attractive, and even investment of type ($a_2$) might be postponed so that investment of type ($c$) which had been awaiting a favourable opportunity would be undertaken as credit conditions were relaxed. On the other hand, if mechanisation of manual processes (*i.e.*, type ($c$) investment) had been using up too large a proportion of the available savings, the replacement of ageing machines would become more urgent, and as credit was restricted a larger proportion of savings would be devoted to that purpose. The movement of the *relative* prices of different commodities

could be relied upon to reflect to some extent the shortages and excesses of machines in different parts of the economy, and thus to help in their correction. Provided employers were reasonably successful in foreseeing major developments and provided the variation of interest rates and other controls on investment succeeded in ensuring that the right amount was spent altogether on investment, one should be able to rely on the pricing mechanism and the individual decisions of employers to ensure that neither too much nor too little of this was spent on increased mechanisation (as opposed to the replacement and duplication of existing machines). In more technical language, provided monetary and other controls ensure just enough investment to preserve steady full employment, the pricing system and the profit motive should be sufficient under the influence of these controls to secure the right amount of capital deepening.

*Summary of conclusions of Section III*

If the natural warranted and maximum growth-rate curves all remain fixed, stagnation crisis will or will not eventually arise according as the natural growth-rate curve lies below or above the point of intersection of the other two curves: this, *ceteris paribus*, sets a lower limit to the rate of technical progress, if stagnation crisis is to be avoided.

Inflation crisis is assumed to occur if real wage-rates fail to rise with growth rate as high as $\omega$: the effects of neutral technical progress on inflationary pressure depend on whether the technical progress coefficient $\theta$ is greater of less than the redistributive coefficient $\theta'$. If $\theta < \theta'$ technical progress on balance is inflationary, and an upper limit is set on its rate, if inflation is to be avoided; but if $\theta > \theta'$ it eases inflationary pressure and a lower limit (which may be negative) is set for the rate of technical progress if inflation is to be avoided. The effect of labour-saving bias is, *ceteris paribus*, to increase inflationary pressure and make stagnation crisis more remote; capital-saving bias has, *ceteris paribus*, the opposite effect.

Provided inflation crisis and stagnation crisis are avoided and provided the authorities keep an overall balance between investment and the supply of savings, it may be hoped that the profit motive and market mechanism will maintain a proper balance between the numbers of men and machines.

## IV. The Rate of Profit on Capital

The most elegant theory of the determination of the rate of profit on capital is that which supposes that it must be equal to the marginal efficiency of capital. This latter concept may be defined as the value of the extra output due to net investment divided by the value of that net investment, technical knowledge and population being supposed constant. If we denote

this ratio by $r'$ it will be seen that if it could be assumed that the value of net investment could be equated to the rate of increase of the value of capital, then $r'$ is related to the production function by the relation

$$r' = \frac{df}{dK} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.1)$$

where $Y = f(K)$ expresses the dependence of productivity on the value of capital per head in the given state of technical knowledge.

However, owing to the possibility that accumulation may alter the relation between the prices of capital and consumption goods, the equation (4.1) need not hold, and the marginal efficiency of capital will be given as some other function of capital per head $r' = h(K)$.[1]

The form of this function will depend not only on the productivity function $f(K)$ but also on the "time shape" of the production processes used at each stage of development.

The theory can still be developed that the rate of profit on capital must equal the marginal efficiency of capital so determined.

The theory has to be based on very extreme assumptions about perfect competition and the readiness and ability of employers to seize every opportunity to "maximise their profits"; it also assumes away any differences between marginal private productivity and marginal social productivity.

Prices are assumed to be rapidly adjusted so that the level at which profits are maximised is just sufficient to cover interest costs.

Despite its elegance, this theory rules out more of the important influences actually found to affect profit rates than do some other theories.

A second theory regards the rate of profit on capital as being set at the level which equates the rate of investment and the rate of savings. When employment is full an increase in the rate of profit is likely to increase the rate of investment which employers are prepared to undertake. But this theory supposes that savings are even more sensitive to an increase in the profit rate, owing to the fact that the proportion saved out of profits is so much higher than that out of wages. The theory supposes that the distribution of income between wages and profits is so adjusted that the available savings and the investment undertaken are in balance. The theory is illustrated by Fig. 7: it will be understood that the theory allows for movements of the investment curve in response to changes in the value of capital per head. One difficulty about this theory is that one suspects the investment curve would in fact be steeper than the savings curve so that the equilibrium would be unstable. However, the theory can be refined so as to meet this and other objections.[2]

Another theory is that in an economy enjoying continuous full employment investment will tend to exceed the value of savings available but can

[1] For a fuller discussion of this point, see Appendix III.

[2] See Kaldor, *op. cit.*

be held down to their level by means of various restrictions and restraints. The economy on this view can be driven with the brakes on.

The rate of profit, on this view, is determined by the percentage which employers add on to direct costs when fixing prices.

The rate of growth of capital is determined by the flow of savings available at full employment when the rate of profit is at this level. The rate of investment, which tends to run ahead of this rate of savings, is kept down to

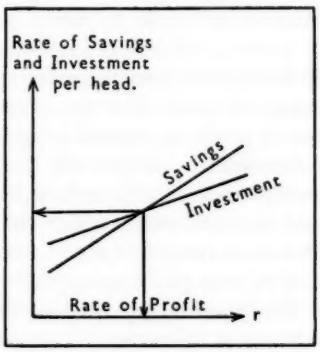


FIG. 7.—Determination of $r$.

equality with it by a whole set of restrictive influences, including some or all of the following:

(i) the deterrent effects of uncertainty on both borrowers and lenders;

(ii) shortages and supply delays in materials and intermediate goods required for investment;

(iii) deliberate restriction and rationing of credit by the authorities;

(iv) other more direct controls on investment.

There is an element of truth in each of these three theories. The marginal efficiency of capital no doubt exerts an influence, albeit a weak one, on the average rate of profit on capital, because given the possibilities and costs of borrowing, the rate at which employers wish to invest will be the higher the higher is the marginal efficiency of capital. Any such wish for more investment will increase the need for credit restriction and other curbs on investment: costs of borrowing will rise, and this combined with the boom conditions will encourage employers to charge rather higher percentage mark-ups on direct costs.

On the other hand, when the marginal efficiency of capital is low and stagnation crisis is being approached, an easy credit policy will be needed, stocks will begin to accumulate in some industries, and employers in these industries will lower their profit margins.

But although the rate of profit on capital will for these reasons fall and rise at the same time as the marginal efficiency of capital, as capital accumulation runs ahead of or falls behind technical opportunities, one should not overestimate this effect. Employers are not likely to drive prices up to the full extent possible in periods when investment opportunities run temporarily ahead of the full-employment savings available at normal profit levels. Nor, if employers were so inclined, would the authorities necessarily remain inactive: they might restrain the boom either by high interest rates and instructions to banks to ration credit or by more direct physical controls.

As a result of such restrictions and imperfections of competition it is quite possible for the marginal social efficiency of capital to stand very high without the average rate of profit on capital being driven to nearly such a high level. In such a situation real wages will be higher than they would have been in a perfect competition model, and the highest rates of profit will be obtainable in precisely those industries which offer the best opportunities of mechanisation. The *average* rate of profit on capital may be well below even the marginal rate of private profit on capital obtainable in these particular industries; and this marginal private rate of profit may itself stand well below the marginal social efficiency of capital because of the high marginal cost of labour to the firms which are expanding.

For these reasons the rate of profit on capital may be regarded as being influenced by the marginal social efficiency of capital to an extent dependent on:

(i) the degree of restraint of the employers in pushing up profit margins to the full extent possible;

(ii) the degree of restraint on investment imposed by the authorities and by caution and uncertainty.

*Given* the extent of these restraints, we may regard the rate of profit on capital as a function of $r'$ the marginal social efficiency of capital, which itself depends in a given state of knowledge on the value of capital per head. It is for these reasons that the rate of profit on capital may, with given technical knowledge, and given the extent of the restraints, be represented as a function $g(K)$ of the value of capital per head. This function $g(K)$ will for given $K$ be the lower the greater the degree of the restraints.

It is interesting to consider briefly the respective effects of high and low degrees of restraint, which appear in our model as low and high levels of the function $g(K)$.

Given the rate of technical progress $T$ and the coefficient $\theta$, and $\gamma$ the growth rate of population, we know that if dynamic equilibrium is reached the growth rates of capital and productivity will be $T + \gamma$ and $\theta T$, whatever the level of the function $g(K)$. But a low level of the function $g(K)$ will lower the growth rates of capital and of productivity during the period of

approach to that equilibrium. If the net effect of technical progress is inflationary ($\theta' > \theta$), then restraints causing a low level of $g(K)$ will greatly reduce the dangers of inflation. If these restraints were still imposed when stagnation crisis was approached they would similarly *increase* the danger of stagnation crisis; but we have supposed in our definition of the maximum growth rate of capital that any deliberate restraints would be abandoned in such circumstances; this supposition seems reasonable, and the danger of stagnation crisis is thus affected only by the degree of those restraints which are unavoidable.[1]

The method of analysis of the earlier sections is appropriate only if the degree of restraint is supposed constant in the sense that the rate of profit $r$ corresponding to any given level $r'$ of the marginal social efficiency of capital $r$ remains roughly constant.

If policy were rapidly altering the relation of $r$ to $r'$, we could no longer regard the rate of profit $r$ as a useful index of the degree to which capital accumulation was abreast of technical progress. In this case we should have to reconsider the definition of the rate of technical progress. Instead of defining it as that rate of growth of capital which (with constant population) would allow $r$ to be constant, we should have to define it as that growth rate which would allow $r'$, the marginal social efficiency of capital, to remain constant.[2] Provided, however, we confine our analysis to the case where the degree of restraint is constant in the sense that $r$ is fixed for given $r'$, the two definitions of the rate of technical progress are of course equivalent.

## V. Unsteady Development

Most of our discussion so far has been concerned with the long-run effects of steady conditions. But it has been pointed out in Section II that there are really no good reasons to suppose that in the real world those influences which in our model determine the curves of warranted or natural growth rates of capital *will* remain steady. It is therefore desirable to consider what will be the result in our model if these two curves are constantly shifting about.

The danger of stagnation crisis is not greatly affected by such short-term movements, since this can result only from a gradual fall of the rate of profit on capital down to the crisis level $r_c$. It is true, however, that if stagnation crisis was already near, a falling off in the rate of technical progress or the growth of population could cause the rate of profit on capital to start falling and thus soon precipitate the crisis.

But the danger of inflation crisis could be greatly increased if technical advance was sporadic, especially if capital equipment was all fairly up to

[1] For example, caution and uncertainty due to extraneous factors.

[2] This definition has not been adopted, since its use would considerably confuse the exposition of the working of the model.

date and the marginal social efficiency of capital and the rate of profit on capital had begun to fall off rather sharply.

In these circumstances $\theta'$, our measure of the redistributive effects of technical progress, might be quite considerable, and a quick burst of technical progress could easily raise the marginal social efficiency quite sharply, and thus raise the rate of profit on capital so much as to absorb not only the immediate good effects of the progress on productivity but also the good effects of such savings as were still available for capital deepening after the needs of an increasing population had been met.

Increases of working population due to recent changes in fertility or mortality are perhaps unlikely to be sharp and sudden. But a sharp increase could result from a flood of immigrants: this might, in our model, cause an inflationary crisis if real wages were in any case almost stationary, either because the savings ratio, the marginal social efficiency of capital and the rate of technical progress were all small or, on the other hand, because $\theta'$ was large and rapid technological progress was having an inflationary effect on balance.

It is possible in principle to predict the entire course of the model from an initial position up to the point, if any, where full employment is lost, from a knowledge of the functions—

$\alpha(t)\ \beta(t)$ = Savings propensities at time $t$.
$F(r, t)$ = Productivity function.
$G(r, t)$ = Capital–output ratio function.
$H(r)$ = Marginal social efficiency of capital.
$\gamma(t)$ = Growth rate of population at time $t$.
$T(t)$ = Rate of technical progress at time $t$.
$\theta(t)$ = Technical-progress coefficient.

This can either be done step by step with the aid of computing machinery or in cases where the functions concerned have artificially convenient forms, by evaluating $r$ algebraically as a function of $t$.[1]

One must also know the maximum growth function $M$ and the workers' demands $\omega$ in order to discover whether and when inflation crisis or stagnation crisis will arise.

## VI. Relation of the Model to those of Other Writers

It will be obvious that many of the ideas underlying this article have been inspired by the work of Mr. R. F. Harrod. This became clear only at the stages of revising the drafts: until after submission of the article there had been no discussions of the subject matter with Mr. Harrod, and the initial inspiration to write the article arose from a discussion with Mr. N. Kaldor about the limitations imposed by some of the assumptions

[1] See Appendix II at end.

made in his recent article on capital accumulation.[1] I also owe a great debt to Professor R. F. Kahn for two brief but (for me) fruitful discussions of the topics dealt with by Mr. Kaldor. Finally, I have been greatly influenced by the various writings of Mrs. Joan Robinson on capital theory.

It is from Harrod's work that the idea of warranted and natural growth rates has been drawn. The results in this model suggest greater stability than he found, because it is supposed that the authorities are capable of rationing investment by suitable credit policy so as to keep it continuously in balance with full-employment savings, and because a greater power is attributed here than in his work to changes in income distribution to affect the savings ratio.

It is from Kaldor's work that the emphasis on this last regulator is taken. From his work also is taken the idea that technical progress can cause some increase in productivity even if (with fixed population) no net savings are performed. A discussion of the relation between the coefficients used in his and in this model is given in Appendix II. But the results here obtained differ from many of Kaldor's in that we do not find any reason to expect an easy passage to an age of uniform progress with a constant capital–output ratio and a constant rate of growth of productivity. On the contrary, these results will appear only if:

(*a*) technical progress is neutral and at a constant rate;[2]
(*b*) population growth rate is constant;
(*c*) the rate of technical progress is such as to avoid both stagnation crisis and inflation crisis.

The difference in results is, of course, due to avoiding some of his assumptions. In particular, we do not assume that employers try to make the capital–output ratio take a certain value (subject to profits on capital being normal); we do not assume that the growth rate of productivity depends only on the growth rate of capital and not also on its marginal social efficiency; nor do we dispose of the problem of the relation between the prices of capital goods and of consumption goods with quite the same conviction as he: we make allowance for the net effect on the value of capital of changes in real wages and profit rates.

It is perhaps at this point that this article derives most from the works of Mrs. Robinson. Some discussion of the relation between this model and hers will be found in Appendix III. On her work was built the underlying notion of a programme of accumulation with fixed technical knowledge, controlled by the simultaneous adjustment of real wage-rates and profit rates. Under perfect competition these adjustments would ensure that investment was always devoted to just that degree of capital deepening which the flow of savings and the rate of population growth justified. We have relied on a

[1] "A Model of Economic Growth," Economic Journal, December 1957.
[2] Or at a rate which is a constant function of the rate of profit on capital.

more rough-and-ready process of adjustment, but the governing principle is the same.

Again from the work of Mrs. Robinson are drawn many of the ideas about the potency of sudden changes and serious bias in technical progress endangering the continuance of full employment.

It is perhaps in the sections dealing with stagnation crisis and the inducement to invest that it becomes most obvious how heavily the author shares in the universal debt to the late Lord Keynes.

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## APPENDIX I

### *Definitions*

Among the basic concepts used in the model of capital growth are:

(i) value of net output per head $Y$;
(ii) value of capital per head $K$;
(ii) value of net savings per head $sY$;
(iv) value of net profits per head $\pi Y$.

In each of these four concepts the words " per head " are intended to convey " per head of the fully employed working population "; in each of them value is to be measured in terms of money, on the understanding that the price level of consumption goods (as measured by a current-weighted price-index number) remains constant through time; in each of them these values are to be measured net of depreciation and obsolescence.

We may assume that the gross value of output per head, with a given stock of capital equipment and given working population, is known and understood but that a more careful definition is required of the value of net output.

With fixed technical knowledge and given fixed working population and a given assortment of initial capital equipment, let $Z$ be the gross value of output per head. In order to preserve the capital stock, including goods in progress, in a sufficiently constant state of repair and age-distribution to allow the gross output per head $Z$ to continue indefinitely, it will be necessary to plough back a part $Z'$, say, of this gross output per head $Z$ for use as capital. The smallest level at which $Z'$ can then in practice be maintained will be taken as the level of depreciation, and the value of net output per head $Y$ is defined by

$$Y = Z - Z'$$

The value of net income per head is defined to equal $Y$, the value of net output per head.

The postulate of constant returns states that if in a given state of technical knowledge the working population and the outfit of capital equipment are both enlarged (or diminished) in the same proportion $\lambda$, then the value of net output per head will be unaltered. It is here to be understood that the capital outfit is as far as is reasonably possible, to be increased item by item in the same ratio $\lambda$, the age composition and state of repair for each kind of equipment remaining unaltered.

In order to define the value of capital we may now envisage a working popula-

tion expanding at the growth rate $\gamma$. We now suppose that in addition to keeping the existing capital intact it is required to expand it, in the manner above described, at the same growth rate $\gamma$ as the population. For this purpose it will be necessary to divert a further part of the gross output per head $\mathcal{Z}$, in addition to $\mathcal{Z}'$, above defined, for use as capital. Let this further part be $\mathcal{Z}''$. It is then reasonable to suppose that $\mathcal{Z}''$ will be proportional to the growth rate $\gamma$, at any rate for moderate values of $\gamma$. Accordingly, put

$$\frac{\mathcal{Z}''}{\gamma} = K$$

This value of $K$ will be taken by definition to be the value of capital per head. So defined it has the property that if capital per head is to be maintained constant at the level $K$, then the net savings per head required are $\mathcal{Z}'' = \gamma K$, where net savings per head $s\mathcal{Y}$ are, as usual, defined as the excess of net income per head over consumption per head. $s$ is by definition the savings ratio.

Finally, the value of profits per head $\pi\mathcal{Y}$ are defined as the excess of net income per head over wages per head.

The capital–output ratio is defined as $A = \dfrac{K}{\mathcal{Y}}$

The rate of net profit on capital is defined as $r = \dfrac{\pi}{A}$

We assume in the model that the output per head $\mathcal{Y}$ obtainable when the capital per head is $K$ is in a given state of technical knowledge a fixed function $f(K)$. We shall refer to the graph of $f(K)$ as the productivity curve.

These definitions require supplementation directly we admit the possibility of technical progress.

Suppose, then, that at one given moment there is an advance in technical knowledge: the existing outfit of capital equipment is then likely to be inappropriate to the new conditions in various respects, and it is by no means obvious how the using-up and replacement of this old-fashioned equipment should be allowed for in calculating net investment and net savings.

The following solution is designed to ensure that the new productivity curve comes into operation immediately new technical knowledge is available without having to wait for the change-over of capital equipment.

Net savings should be regarded as the excess of net income over consumption, and this leaves net income to be defined at the moment when the new knowledge has become available but we are still saddled with old equipment.

Again we may suppose that a part $\mathcal{Z}'$ of gross income per head $\mathcal{Z}$ is ploughed back for replenishing the stock of capital. As a first approximation we might define net output per head to be the largest level of $(\mathcal{Z} - \mathcal{Z}')$ that could be maintained indefinitely. This corresponds well with our earlier definition, but it is not quite satisfactory, since if one were saddled with old-fashioned equipment the most profitable thing to do might well be to vary the rate of $(\mathcal{Z} - \mathcal{Z}')$ somewhat. The following definition is better: net output per head is the highest *eventual* value of $(\mathcal{Z} - \mathcal{Z}')$ that can be maintained after introducing modern equipment, subject to the condition that the *average* level of $(\mathcal{Z} - \mathcal{Z}')$ during conversion is no less than this *eventual* rate.

This definition implies that with constant population when the change-over is conducted in the most efficient manner subject to there being zero savings on average, and hence zero change in the quantity of capital during the change-over, there will be the same net output per head after the change-over as immediately after the new technical knowledge became available. It therefore enables

us to suppose that the productivity curve remains stationary during the change-over having jumped to its new position immediately the new technical knowledge became available.

Having defined net output per head $Y$ at a moment following an advance in technical knowledge, we now use the productivity curve corresponding to the new state of technical knowledge to discover $K$, the value of capital per head. This curve tells us the value of capital per head that would be required to allow net output per head $Y$ if the technical knowledge had been available for a long time. We *define* the value of capital per head *immediately* after the advance in knowledge to be this same value $K$, since although some of the equipment is old fashioned, it allows the same value $Y$ of net output per head to be achieved.

Advances of technical knowledge may now be thought of as occurring every night, so that every day starts with the economy represented by a new point on a new production curve. It will be clear from these definitions that the new knowledge can increase net output per head and the value of capital per head overnight without any alteration being yet made to the capital equipment.

This possibility is allowed for in our model. Indeed, in Appendix II the situation where population is stationary and the growth rate of capital is zero but technical progress continues at the rate $T$ is specifically considered, and it is supposed that productivity will then have the growth rate $\rho T$. It is shown that the coefficient $\rho$ is simply expressed in terms of the technical progress coefficient, the marginal social efficiency of capital and the capital–output ratio by the equation

$$\rho = \theta - r'A$$

## Appendix II

### *Mathematical Summary of the Text*

*Notation*

| | |
|---|---|
| $K$, $Y$ | Values of capital per head and net output per head (productivity). |
| $s$, $A$, $\pi$ | Ratios of the values of net saving, capital and net profits to net output per head. |
| $\alpha$, $\beta$ | Proportions saved out of net profits and wages, the two constituents of the value of net output if employment is full. |
| $r$ | Ratio of net profits to value of capital. |
| $\gamma$ | Growth rate of population. |
| $W$, $N$, $M$ | Warranted, natural and maximum growth rates of capital. |
| $T$ | Rate of technical progress $= N - \gamma$. |
| $\nu$ | Growth rate of productivity when growth rate of capital is $N$. |
| $\theta$ | Technical progress coefficient. |
| $\theta'$ | Ratio of growth rate of real wages to that of capital when population and technical knowledge are fixed. |
| $\omega$ | Growth rate of real wage-rates needed to avoid inflation crisis. |
| $r'$ | Marginal social efficiency of capital. |

We assume the following identities to hold:

$$A = K/Y \qquad s = \pi\alpha + (1 - \pi)\beta \qquad rA = \pi \quad . \quad . \quad . \quad (1)$$

$$W = s/A. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where $W$ is the warranted growth rate of capital, namely that necessary if full employment is to be preserved.

The following functions denote the relation of $\Upsilon$ and $A$ to $r$ given the technical knowledge available at time $t$

$$\Upsilon = F(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

$$A = G(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

Technical progress is labour saving, neutral or capital saving according as

$$\partial G/\partial t >, = \text{or} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

(it might thus be labour saving for some values of $r$ and capital saving for others).

The natural growth rates of capital $\mathcal{N}$ and of productivity $\nu$ are defined to be those growth rates which are consistent with the condition

$$dr/dt = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

It is assumed that any higher (lower) growth rate of capital than $\mathcal{N}$ will cause $r$ to decrease (increase).

The rate of technical progress $\mathcal{T}$ is defined by the equation

$$\mathcal{N} = \mathcal{T} + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

The technical progress coefficient $\theta$ is defined as

$$\theta = \nu/\mathcal{T} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

When employment is full the growth rate of capital equals the warranted growth rate $W$. Hence by (6) and (7)

$$dr/dt < \text{or} > 0 \text{ according as } W > \text{or} < \mathcal{T} + \gamma \quad . \quad . \quad . \quad (9)$$

Also
$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = \nu + \frac{1}{\Upsilon}\frac{\partial F}{\partial r}\frac{dr}{dt} = \theta\mathcal{T} + \frac{1}{\Upsilon}\frac{\partial F}{\partial r}\frac{dr}{dt} \quad . \quad . \quad . \quad (10)$$

Since
$$W = (\alpha - \beta)r + \beta/A \text{ and } A = G(r, t); \ \frac{\partial G}{\partial r} < 0 \quad . \quad . \quad (11)$$

we may write
$$W = W(r, t) \quad \frac{\partial W}{\partial r} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

$\partial W/\partial t <, = \text{or} > 0$ according as technical progess is labour saving, neutral or capital saving . . . . . (13)

If technical progress is neutral at the constant rate $\mathcal{T}$ and population has the constant growth rate $\gamma$, then we may write

$$G(r, t) = G(r) \qquad W(r, t) = W(r) \qquad dW/dr > 0 \quad . \quad . \quad (14)$$

$$\text{and } dr/dt >, = \text{or} < 0 \text{ according as } W(r) <, = \text{or} > \mathcal{T} + \gamma. \quad (15)$$

that is according as

$$r <, = \text{or} > r_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

where $r_x$ is the root in $r$, if any of

$$(\alpha - \beta)r + \{\beta/G(r)\} = \mathcal{T} + \gamma \quad . \quad . \quad . \quad . \quad . \quad (17)$$

The value of $r$ will therefore continue to approach the level $r_x$ for so long as full employment is preserved. In dynamic equilibrium

$$r = r_x; \ A = G(r_x) \text{ and } W = \mathcal{T} + \gamma \quad . \quad . \quad . \quad . \quad (18)$$

The growth rate of productivity will then be given by

$$\nu = \theta\mathcal{T} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (19)$$

where $T$ is *by definition* the rate of growth of productivity when the growth rate of capital equals the natural growth rate. Thus with neutral progress the growth rate of productivity in dynamic equilibrium is affected by the savings propensities $\alpha$ and $\beta$ and by the growth rate of population $\gamma$ only in so far as these affect the rate of profit $r$ and in so far as the coefficient $\theta$ and rate $T$ of technical progress may be affected one way or the other by changes in the rate of profit.

When technical progress is labour saving and $T$, $\alpha$, $\beta$, $\gamma$ remain constant, $r_x$ the root in $r$ of (17) must be constantly increasing, since $\partial G/\partial t > 0$.

Hence since $\frac{dr}{dt}$ has the same sign as $(r_x - r)$, this sign must eventually become, and thereafter remain, positive in common with that of $\frac{dr_x}{dt}$.

It follows from (3) and (10) that the growth rate of productivity eventually is less than $\theta T$, and hence, given full employment and $\gamma$ and $T$, the effect of the labour-saving bias in technical progress must be to diminish the eventual growth rate of productivity. Conversely, the effect of capital-saving bias must be to increase the eventual growth rate of productivity.

*Stagnation Crisis*

We assume, given full employment, that the condition for the avoidance of stagnation crisis is

$$M(r, A) \geqslant W \quad \left(\frac{\partial M}{\partial A} > 0, \frac{\partial M}{\partial r} > 0\right) \quad . \quad . \quad . \quad . \quad (21)$$

where
$$W = (\alpha - \beta)r + \beta/\alpha \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

and where at time $t$

$$A = G(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (23)$$

We may again write this condition in the form

$$\mathscr{M}(r, t) \geqslant W(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (24)$$

where
$$\mathscr{M}(r, t) = M\{r, G(r, t)\}$$

$$W(r, t) = (\alpha - \beta)r + \{\beta/G(r, t)\} \quad . \quad . \quad . \quad (25)$$

We *assume* that for all $t$, $\mathscr{M}(r, t) = 0$ for some sufficiently small positive $r$, and

$$\frac{\partial \mathscr{M}}{\partial r} > \frac{\partial W}{\partial r} \text{ for all } r \quad . \quad . \quad . \quad . \quad . \quad . \quad (26)$$

It follows that for given $t$ there is a unique positive $r_c$ such that $\mathscr{M}(r_c, t) = W(r_c, t)$ and that the condition for avoidance of stagnation crisis is

$$r \geqslant r_c \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (27)$$

In the case where $T$ and $\gamma$ are independent of $r$ we have seen (15), (16) and (17) that

$$\frac{dr}{dt} >, = \text{or} < 0$$

according as
$$r <, = \text{or} > r_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28)$$

where
$$W(r_x, t) = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (29)$$

Hence if $r_x > r_c$ and *if $r_c$ is not increasing*, $r - r_c > 0$ whenever $\frac{d}{dt}(r - r_c) < 0$, and hence $r$ can never become less than $r_c$.

Hence the two conditions $r_x > r_c$ and $\frac{d}{dt} r_c \leqslant 0$ are sufficient to ensure the avoidance of stagnation crisis.

In particular, if technical progress is neutral, $_x$ and $r_c$ will be constant and stagnation crisis will be avoided provided $r_x > r_c$.

If technical progress is labour saving $r_c$ must be falling.

For differentiating with respect to $t$ the equation

$$\mathscr{M}(r_c, t) - W(r_c, t) = 0$$

we obtain

$$\frac{\partial \mathscr{M}}{\partial t} - \frac{\partial W}{\partial t} + \frac{dr_c}{dt}\left\{\frac{\partial \mathscr{M}}{\partial r} - \frac{\partial W}{\partial r}\right\} = 0 \quad . \quad . \quad . \quad (30)$$

Hence since we have assumed

$$\frac{\partial \mathscr{M}}{\partial r} - \frac{\partial W}{\partial r} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (31)$$

the sign of $\frac{dr_c}{dt}$ is that of

$$\left\{\frac{\partial W}{\partial t} - \frac{\partial \mathscr{M}}{\partial t}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (32)$$

Now if technical progress is labour saving $\partial G/\partial t > 0$, and hence $\partial W/\partial t$ is negative and $\partial \mathscr{M}/\partial t$ is positive: it follows from (32) that $r_c$ is falling as stated above.

Thus the effect of labour-saving progress is to make the risk of stagnation crisis more remote. Conversely, capital-saving bias must bring the danger nearer.

*Inflation Crisis*

We assume that inflation crisis will be avoided only so long as real wages have a growth rate of at least $\omega$. We may express this condition in the form

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} \geqslant \omega \quad . \quad . \quad . \quad . \quad . \quad . \quad (33)$$

We define $\theta'$ by the property that when technical knowledge and population are fixed and employment is full

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta' \quad . \quad . \quad . \quad . \quad . \quad . \quad (34)$$

where $W$ is the warranted (and hence actual) growth rate of capital.

If, on the other hand, population has the growth rate $\gamma$ and technical progress is at the rate $T$ and is neutral

$$\frac{1}{(1-\pi)\Upsilon}\frac{dt}{d}\{(1-\pi)\Upsilon\} = \theta'\{W - T - \gamma\} + \theta T \quad . \quad . \quad (35)$$

Hence the condition for avoiding inflation crisis may be written

$$\omega \leqslant \theta'(W - \gamma) + (\theta - \theta')T \quad . \quad . \quad . \quad . \quad . \quad . \quad (36)$$

If dynamic equilibrium is reached $W - \gamma = T$, so that this condition then reduces to

$$\omega \leqslant \theta T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (37)$$

But until equilibrium is reached the effect of technical progress depends on the sign of $(\theta - \theta')$. If $\theta > \theta'$ technical progress reduces inflationary pressure and the condition (36) may be expressed

$$T \geqslant \frac{\omega}{\theta - \theta'} + \frac{\theta'}{\theta - \theta'}(\gamma - W) \quad . \quad . \quad . \quad . \quad . \quad (38)$$

But if $\theta' > \theta$ technical progress has an inflationary effect and the condition (36) may be written

$$T \leqslant \frac{\theta'}{\theta' - \theta}(W - \gamma) - \frac{\omega}{\theta' - \theta} \quad . \quad . \quad . \quad . \quad . \quad (39)$$

When labour-saving bias is present (35) must be amended by the addition of a term representing the rate of growth of $(1 - \pi)$ with $r$ held constant.

It becomes

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta'(W - T - \gamma) + \theta T - \frac{1}{1-\pi}\left(\frac{\partial \pi}{\partial t}\right)_{r \text{ const.}}$$

$$\therefore \quad \frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta'(W - T - \gamma) + \theta T - \frac{r}{1-\pi}\frac{\partial G}{\partial t} \quad . \quad (40)$$

The condition on $\omega$ thus becomes

$$\omega \leqslant \theta'(W - \gamma) + (\theta' - \theta)T - \frac{r}{1-\pi}\frac{\partial G}{\partial t} \quad . \quad . \quad . \quad (41)$$

Labour-saving progress makes $\partial G/\partial t$ positive, thus reducing the upper limit on $\omega$: it thus increases inflationary pressure at any moment.

It also increases inflationary pressure in dynamic equilibrium: for we have seen that its effect then is to make $(W - \gamma - T)$ negative as well as to make $\partial G/\partial t$ positive; on both counts the upper limit in (41) is less than the corresponding upper limit $\theta T$ of (37) that would apply if technical progress were neutral.

Similar proofs will establish that capital-saving bias reduces inflationary pressure both *en route* to and in dynamic equilibrium.

*The Marginal Efficiency of Capital $r'$ and the Basic Rate of Technical Progress $\rho$.*

The marginal efficiency of capital $r'$ may be defined by the property that with fixed population and zero rate of technical progress

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = r's \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (42)$$

Provided there is full employment,

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = r'AW \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (42a)$$

In the more general case where there is technical progress at rate $T$ and population growth at rate $\gamma$

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dT} - \theta T = r'A(W - \gamma - T) \quad . \quad . \quad . \quad . \quad (43)$$

It follows that even if $W = \gamma$, so that all savings are absorbed into "capital-widening" to provide for the extra population, the technical progress may still increase productivity under the conditions of our model: for if $W = \gamma$,

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = (\theta - r'A)T = \rho T \text{ (say)} \quad . \quad . \quad . \quad . \quad . \quad (44)$$

where $\rho$ may be called the *basic rate of technical progress*. We may regard $\rho T$ as that growth rate of productivity which costs no savings, and is due to the effects of technical progress on the efficiency and economy with which existing equipment can be used and replaced. It is sometimes useful to regard the technical progress coefficient $\theta$ as determined by $r'$, $A$ and $\rho$, and to rewrite the right-hand part of (44) in the form

$$\theta = \rho + r'A \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (45)$$

This formulation shows the relation of our concepts to those employed in Mr. Kaldor's model in his equation (3). Thus $\rho T$, the basic rate of technical progress, corresponds to his $\alpha''$, and $r'A$ corresponds to his $\beta''$: our technical progress coefficient $\theta$ then is given, in terms of his $\alpha''$ and $\beta''$ and our $T$, as

$$\theta = \beta'' + \alpha''/T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (46)$$

The condition ($\theta' \leqslant \theta$) that technical progress should not exert an inflationary influence can also be expressed in terms of $\rho$, $r'$ and other concepts.

For
$$\theta' = r'A\left\{1 + \frac{\Upsilon}{1-\pi}\frac{d(1-\pi)}{d\Upsilon}\right\}_{t \text{ const.}} \quad . \quad . \quad . \quad . \quad (47)$$

Hence by (45) the condition $\theta' \leqslant \theta$ may also be written

$$\frac{\rho}{r} \geqslant \frac{A\Upsilon}{1-\pi}\left\{\frac{d(1-\pi)}{d\Upsilon}\right\}^{1}_{t \text{ const.}} \quad . \quad . \quad . \quad . \quad (48)$$

which shows what critical level the ratio of the basic rate of technical progress to the marginal social efficiency of capital must achieve if the effect of technical progress is not on balance to be inflationary.

*Working of Model: Algebraic Solution*

A detailed specification of the values that the various economic variables, $Y$, $K$, $T$, etc., will take for specified values of $t$ would usually require very heavy computation, advancing step by step over small time-intervals $\Delta t$. However, if the various functions are sufficiently simple it is possible to obtain an algebraic solution with the aid of a desk calculating machine.

For example, suppose that $\alpha$, $\beta$, $\nu$ and $\mathcal{N}(= T + \gamma)$ are all constants independent of $t$ and $r$, and that $\log F(r)$, $G(r)$ and $H(r)$ are all polynomials of low degree in $r$, independent of $t$, where

$$\Upsilon = e^{rt}F(r),\ A = G(r),\ r' = H(r)$$

Then
$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = \nu + \frac{d}{dr}(\log F)\frac{dr}{dt}$$

and
$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = \nu + r'A(\mathcal{N} - W)$$

where
$$W = (\alpha - \beta)r + \beta/A$$

Hence
$$\frac{dr}{dt} = H(r)[G(r)\{\mathcal{N} - (\alpha - \beta)r\} - \beta]\Big/\frac{d}{dr}(\log F) \quad . \quad . \quad (49)$$

[1] $\frac{d(1-\pi)}{d\Upsilon}$ can also be expressed in terms of the functions $F$ and $G$ as $\left\{A + r\frac{\partial G}{\partial r}\right\}\Big/\left\{-\frac{\partial F}{\partial r}\right\}$.

so that if $r = r_0$ when $t = 0$, the value of $t$ when $r$ achieves some other value $r_1$ is given by

$$t_1 = t(r_1) = \int_{r_0}^{r_1} \frac{\frac{d}{dr}(\log F)\, dr}{H(r)[G(r)\{N - (\alpha - \beta)r\} - \beta]} \qquad (50)$$

In the case where $\log F$, $G(r)$ and $H(r)$ are all polynomials of low degree in $r$ the integrand can be expanded as the sum of partial fractions and $t(r)$ found algebraically. The value of the inverse function $r(t)$ may then be found by graphical or numerical methods for specific values of $t$, and hence also the values of the other economic variables at these dates.

A knowledge of $\omega$ and $M(A, r)$ will then be required as well, in order to check whether inflation crisis or stagnation crisis will interrupt the working of the model at any stage.

## Appendix III

### *The Quantity of Capital*

It is assumed in our model that, with fixed technical knowledge, net output per head $\Upsilon$ is a function $f(K)$ of the value of capital per head. Mrs. Robinson has examined [1] what happens when there are a series of discrete values $\Upsilon_\gamma$, $\Upsilon_\beta$, $\Upsilon_\alpha$ . . . which the value of net output per head can take, corresponding to particular techniques $\gamma$, $\beta$, $\alpha$ . . . . $\Upsilon$ is made to increase from $\Upsilon_\gamma$ to $\Upsilon_\beta$ by varying the mixture of $\gamma$ plants and $\beta$ plants, and then from $\Upsilon_\beta$ to $\Upsilon_\alpha$, by varying the mixture of $\beta$ and $\alpha$ plants. She shows that during the transition from $\Upsilon_\gamma$ to $\Upsilon_\beta$ profit rates and real wages will remain constant; but at $\Upsilon_\beta$ they will jump to new levels at which they will stay until $\Upsilon_\alpha$ is reached. The result is that in this discontinuous case a productivity curve relating productivity to the value of capital per head will have the characteristics of the stepped curve in the following diagram.

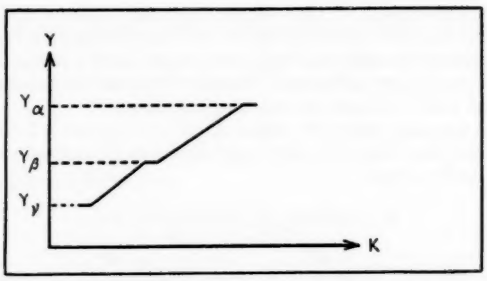



Fig. 8.—Productivity with discrete techniques.

The horizontal sections correspond to changes in the capital–output ratio due to the changes of real wages and interest rates at the levels $\Upsilon_\gamma$, $\Upsilon_\beta$, $\Upsilon_\alpha$ . . . . But the function $\Upsilon = f(K)$ is best conceived as relating to a smoothed version of the stepped curve, as is suggested by the dotted curve drawn through the stepped curve.

Our definition of $r'$, the marginal social efficiency of capital, was that it was the extra net output from net investment divided by the cost of that investment,

[1] *Review of Economic Studies*, Vol. XXI (2), No. 55, pp. 81–106.

population and technical knowledge being constant. In terms of our diagram, $r'$, on this definition, is the gradient of one of the sloping sections of the stepped curve. But this is quite different from the *average* gradient of the value of net output per head with respect to the *value* of capital per head, which corresponds to the gradient of the dotted curve $PQ$.

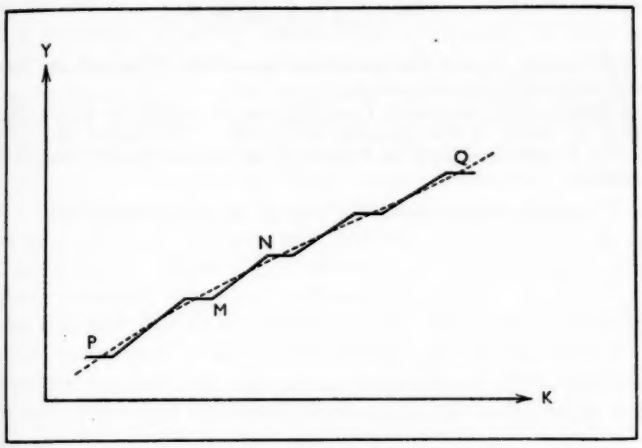



FIG. 9.—The productivity function $f(K)$.

In terms of our function $\Upsilon = f(K)$, this latter gradient is $df/dK$.

If it were not for the horizontal steps we should have $r' = \dfrac{df}{dK}$. Suppose in fact that $\zeta r' = df/dK$.

Then if $K_P\Upsilon_P$ and $K_Q\Upsilon_Q$ are the values of capital per head and net output per head corresponding to the points $P$ and $Q$,

$$\Upsilon_Q - \Upsilon_P = \frac{df}{dK}(K_Q - K_P) = \zeta r'(K_Q - K_P)$$

But

$$\Upsilon_Q - \Upsilon_P = r'(K_Q - K_P - U)$$

where $U$ is the total of the horizontal steps within $PQ$; hence $1 - \zeta$ is the proportion of $U$ to $(K_Q - K_P)$.

Savings and investments are only needed for increasing $K$ up the slanting parts of the solid curve: movement along the horizontal section merely represents price changes and requires no savings or investment. Hence with fixed population the value of net savings and investment per head bears the ratio $\zeta$ to the associated increase in the value of capital per head.

We can also express this by saying that the value of the increment of the quantity of capital per head is $\zeta$ times the increment of the value of capital per head. Hence the growth rate of the quantity of capital per head is $\zeta$ times the growth rate of the value of capital per head where

$$\zeta = \frac{df}{dK}\Big/r'$$

Given the functions $Y = f(K)$ and $r' = h(K)$, an index $L$ of the quantity of capital per head is therefore related to $K$ the value of capital per head by the differential equation

$$\frac{K\,dL}{L\,dK} = \frac{df}{dK}\Big/h(K)$$

whence

$$\log\left(\frac{L_1}{L_0}\right) = \int_{K_0}^{K_1} \frac{df/dK}{Kh(K)}\,dk$$

where $K_0$, $K_1$ and $L_0$, $L_1$ are the values and quantities of capital per head in the base-period and in the current period.

A knowledge of the functions $Y = f(K)$ and $r' = h(K)$ is thus sufficient for constructing an index of the quantity of capital. The index thus found will be equivalent to that described in a note on the measurement of capital by the present author.[1]

[1] *Review of Economic Studies*, Vol. XXI (2), No. 55, pp. 116 and 125.

# FACTOR-PRICE RELATIONS UNDER FREE TRADE[1]

In two well-known articles [2] Professor Samuelson showed that in conditions of free trade, and subject to certain assumptions, *either* the prices of factors in different countries would come to equality *or* there would be complete specialisation by country as regards goods capable of entering into international trade. This conclusion was rather shattering to many economists, and it seems to jar very badly with the manifest facts of the case. It was disturbing to mature economists who are trying to address their minds, with such tools of thought as our science has to offer, to current problems of no little moment, such as investment in under-developed countries, the lowering of trade barriers and migration policy. It was disturbing also to teachers, on whom it has endowed an uncomfortable *arrière pensée*, when they endeavour to convey to classes whatever the modern version may be of the old-time law of comparative costs, which rests essentially on the assumption of unequal returns to factors in different countries and has not been supposed to entail the unrealistic conclusion of 100% specialisation.

It is the purpose of this article to remove the *arrière pensée* and restore the *status quo*.

The reaction of many economists, after a vain struggle to escape from the toils of Professor Samuelson's main argument, was to take refuge in the opinion that his paradoxical results are not achieved in real life, because his more obvious assumptions are not realised, namely, free trade, absence of transport costs and perfect competition, including constant returns to scale. Tariff barriers (which do not exist in all cases) and transport costs appear, however, not to be sufficient to account for the big discrepancies between the facts and Professor Samuelson's theory. Imperfect competition seemed to open the door somewhat wider, if only because the theory of it remains imperfect, and within its ambit anything may happen, so to speak. From the outset I never believed that the disparity between the price pattern as formed under imperfect competition and the price pattern of perfect competition was nearly large enough to account for the observed inequality of factor rewards. Or again, one might take refuge in the idea that labour in low-wage countries was a very inferior kind of labour and a wholly different factor; yet when that same labour migrates to the United States it often seems quite capable of earning the higher wages prevailing there.

I have two comments. The first, which is also probably the more important, is quite straightforward. The second is more intricate and will occupy more space.

[1] Address delivered to the Association of University Teachers in Bristol, January 1957.

[2] Economic Journal, June 1948 and June 1949.

1. Professor Samuelson claims that his conclusion holds, so long as the number of goods is not less than the number of factors.

> "When we add a third productive factor and retain but two commodities, then the whole presumption towards factor-price equalisation disappears. Suppose American labour and American land have more capital to work with than does European labour and land. It is then quite possible that the marginal physical productivities of labour and land might be double that of Europe in both commodities. Obviously, commodity-price *ratios* would still be equal, production of both commodities will be taking place, but none the less absolute factor prices (or relative for that matter) need not be moved towards equality. This is our general expectation wherever the number of factors exceeds the number of commodities" (p. 193, ECONOMIC JOURNAL, 1949).

This proviso probably suffices alone to account for the facts as they are. Commodities usually require some specific factor of production. This is obvious enough in the case of the minerals—the specific ores must be present; it is fairly obvious in the case of many crop products—rubber, cotton, champagne; more humdrum products, such as wheat and wool, are also favoured by specific qualities of soil; Britain, a great wool importer, also exports wool in substantial quantity owing to some of her wool having specific qualities not obtainable elsewhere. In the wide range of processing not only is man-power of diverse specific skills required, but also specific know-hows in technology. An under-developed country may have sufficient managerial and technological man-power to set up a few factories, but just cannot extend its industrialisation for lack of the right kind of personnel.

The condition that there must be more factors than commodities might be thought very stiff in view of the wide range of commodities that exist. Students of imperfect competition are aware of the quite genuine puzzle contained in the question—what is a commodity? It might be legitimate for purposes of international-trade theory to define a commodity as any class of similar objects which require at least one specific kind of factor not also required by any other objects. A commodity so defined will doubtless normally have sub-varieties: a linen manufacturer may produce sheets, pillow-cases, table napkins, etc.; we cannot suppose that specific factors are required for each of these sub-varieties separately. But then it is unlikely that there will be a great difference in the ratios of the generic factors (labour, capital, etc.) as between one variety of linen product and another, so that a nation will commonly enjoy a comparative advantage (or disadvantage) for the whole lot or for none. A nation which makes linen goods for itself and for export may also import certain specialities; but these will usually embody some traditional skills or designs, or rest on some specific know-how, including patents, and for this reason can be classed, by the above definition, as a separate commodity, without increasing the

number of commodities graded as different by more than the number of factors so graded. If there were some object requiring no specific factor but yet embodying quite a different capital/labour ratio from that of its nearest neighbour object, then in the case of such an object and its neighbour, one might allow Samuelson's complete specialisation; but this would surely be an exceptional case and not of much significance in the broad flow of international trade. Furthermore, when we are dealing with the minute sub-varieties of a commodity the doctrines of imperfect competition may indeed come to our aid to explain the failure to get 100% specialisation.

Since there are several generic factors, then, if we allow that commodities may be defined broadly enough to ensure that each commodity requires at least one specific factor, it will follow that there will always be more factors than commodities and we shall be saved from the Samuelson dilemma.

If the presence of specificity in at least one factor is as important as the foregoing argument suggests, this may lead us to doubt whether the approach which Professor Ohlin has popularised, and which, according to Professor Samuelson, was the departing point for his own thinking,[1] is really a helpful one. Professor Ohlin presented the inequality of the endowment of different countries with the generic factors (*e.g.*, capital and labour) as the prime cause of international trade. This approach has since become popular in text-books. I accordingly suspect that Professor Ohlin has shunted the theory of international values on to the wrong track—like other distinguished economists before him!

2. None the less, I propose to examine the two-factor, two-commodity case. The argument that I shall develop applies, I believe, also to all cases where the number of factors does not exceed the number of commodities, *i.e.*, to all cases to which the reasoning of the foregoing paragraphs does not apply. Indeed, the assumption that I propose to challenge is the more unplausible, the more factors there are.

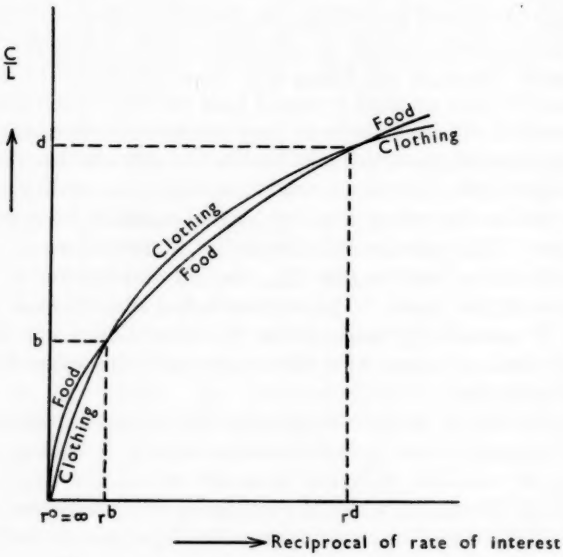
Professor Samuelson assumes that " commodities differ in their 'labour and land intensities.' Thus, food is relatively 'land-using' or 'land-intensive,' while clothing is relatively 'labour-intensive.' This means that whatever the prevailing ratio of wages to rents, the optimal proportion of labour to land is greater in clothing than in food " (p. 182, ECONOMIC JOURNAL 1949).

Is it in general plausible to assume that, if a certain commodity X is A intensive relatively to commodity Y, given a certain ratio for the price of factor A to that of B, it will be so for *all* ratios of the price of A to that of B? Consider the use of labour and capital in the production of food and clothing. A country very short of capital has perforce to use much capital in food production; the processes of nature entail waiting between sowing and harvesting, and much cannot be done without implements and means of storage; clothing may in this phase be produced on simple spindles and

[1] ECONOMIC JOURNAL, 1948, June, p. 163 and ff.

hand-looms in the living-room; food may then be the more capital intensive. If the nation is better endowed it may establish power-driven textile machinery, while its agriculture proceeds on traditional lines; clothing is then more capital intensive. Still better endowed, it may thoroughly mechanise its agriculture, which then ranks as the more capital intensive of the two.

If we introduce more factors, the assumption of constancy in the pattern of factor intensity, whatever the relative prices of the factors, becomes more




C is no. of units of capital employed per unit of product.

L is no. of units of labour employed per unit of product.

FIG. 1

unplausible. If we list labour, capital disposal, land, engineering ability, managerial ability, enterprise, we are still classifying factors by a very broad mesh. At the opening position we can say that ratio of the intensity of labour to capital is higher (+) or lower (−) for Y than for X; there are fifteen ratios of factor intensity, to which we have to assign plus or minus. Is it plausible to suppose that this whole array of fifteen pluses and minuses will remain unchanged, by however much the relative prices of the factors may vary?

In Fig. 1 curves are traced for two commodities, food and clothing. In the case of both, as the rate of interest falls, the capital intensity rises.

(The "rate of interest" gives a very artificial, and indeed inadequate, representation of the supply price of capital. The real cost of borrowing should often be represented by a much higher percentage figure than the rate of interest obtaining in a securities market, which may be narrow.[1])

The curvatures differ for the two commodities, as they must at some point, if, at any point, one commodity is to be more capital intensive than the other. At two points, namely, $r^b$ and $r^d$, the curves are shown as intersecting. When the rate of interest is at either of these levels the optimum (cheapest) way of producing food requires an admixture of capital and labour which is the same as that required for the optimum way of producing clothing. When the rate of interest is above $r^b$ (left-hand end of the diagram), then the ratio of capital to labour is higher in food than is clothing; when the rate is between $r^b$ and $r^d$, then the ratio of capital to labour is higher in clothing than in food; when the rate is below $r^d$, then the ratio of capital to labour is higher in food. There is no *a priori* reason why these curves should intersect or why they should not intersect. If they do intersect, then we have scope, as I shall presently explain, for *free trade with unequal factor prices and incomplete specialisation*, even in a two-factor, two-commodity, two-country model. It is to be noted that Professor Samuelson is here challenged, not on the score of his proof, which is accepted, but on the propriety of one of his assumptions. The reader may think that, if we had a multi-dimensional diagram with fifteen pairs of factor ratios (derivable from five), the required postulate would be unacceptable as the foundation of a general theory, and perhaps unplausible. The required postulate is that, if the ratio between any two factors used in clothing exceeded (or fell short of) that used in food given one set of values for the six factors, it must also exceed (or fall short) for all sets of factor values whatever. Indeed, if it were not for the escape clause provided in the earlier section of this article relating to the specificity of factors, I would argue that the pattern of trade, as we find it in the world to-day, and have found it for many generations, *proves* that the required postulate is not realised in fact.

The consequences of the intersection of these curves for the theory of international trade are shown in Fig. 2. This shows in juxtaposition the

[1] The "rate of interest" is economical of wording in a discussion of this kind, since it dispenses with such a lengthy expression as "the ratio of the supply price of capital to the supply price of labour." The "rate of interest" comprises in one short expression a reference to the ratio between these two supply prices; thus "three per *cent*" means that £3 has to be paid for a year's waiting in respect of embodied labour costing £100 (or in respect of any other embodied factors). If the money value of a unit of labour goes up, the amount of money that has to be paid for a year's waiting in respect of a unit of labour goes up in the same proportion, *unless the rate of interest alters*. A change in the rate of interest thus involves a change in the supply price of a unit of waiting *relatively* to the supply price of a unit of labour; and there can be no change in the supply price of labour relative to that of waiting without a corresponding change in the rate of interest. Thus if one works with the rate of interest, no further reference to the supply price of the other factor is needed; the expression "rate of interest" itself stands for a ratio ($x$ per $y$), one term of which is the supply price of some factor other than waiting.

situations of five countries, A, B, C, D and E, which have increasing capital endowments per unit of labour as we move downwards and to the right. We assume that different rates of interest are established in each, being lower in the countries with the higher capital endowment. In country A the rate of interest is above $r^b$; in country B it stands at $r^b$; in country C it is between $r^b$

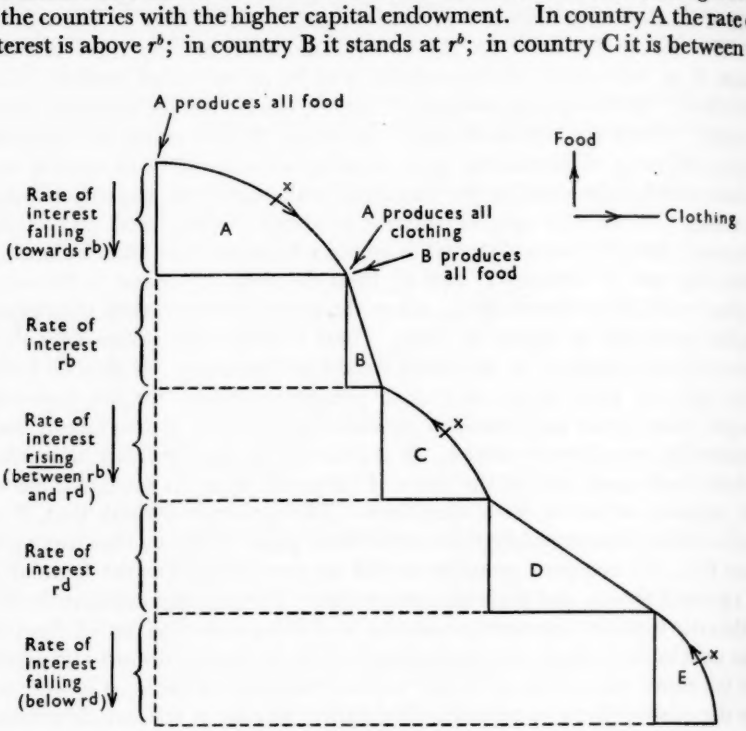



FIG. 2

and $r^d$; in country D it stands at $r^d$; and in country E (the most highly endowed with capital) it is below $r^d$. For each country separately a production-possibility function is shown, and in each country the top left-hand point of the curve represents a condition in which all productive resources are devoted to food, while the bottom right-hand point represents the position in which all productive resources are devoted to clothing.

Let us examine each country in turn. The diagram for country A exhibits the normal pattern. The production-possibility function is concave to the origin. As we move progressively over from the production of nothing but food to the production of nothing but clothing, the rate of interest falls, since clothing is less capital intensive. This fall stimulates the use of more capital-intensive methods, if such are available, in the production of both food and clothing. The distribution of resources between food and clothing will depend, if the economy is insulated, primarily on demand.

The rate of interest will stand at a level that induces methods of production, such that the cost of production (= price) of each commodity induces demands for amounts of each commodity, production of which is consistent with the rate of interest being at that level. Full employment of productive resources is assumed. For the sake of convenience (and the continuity of the graph) we may assume that when interest is at its lowest in A, viz., when all resources are devoted to clothing, the less capital intensive of the two commodities, it is almost as low as it is in B ($r^b$).

The condition of country B (like that of country D) is peculiar, and we need not suppose that any country is ever in fact precisely in this condition. It is inserted in the figure in order to clarify the argument. It appears from Fig. 1 that, if the rate of interest is at $r^b$, the optimum (cheapest) method of producing food requires the same ratio of capital to labour $\left(\text{call it } \frac{C_b}{L_b}\right)$ as does the optimum (cheapest) method of producing clothing. We suppose that the endowment of country B with capital and labour is in the ratio $\frac{C_b}{L_b}$. In such circumstances the rate of interest in country B is unequivocally fixed at $r^b$. Whatever proportions of its resources country B devotes to the production of food and clothing, the rate of interest will be the same, viz., $r^b$. For, since at this rate food and clothing are neither more capital intensive than the other, resources can be switched from food to clothing, or conversely, without making any difference to the requirements for capital and labour in the country. Normally the production-possibility function is concave to the origin. But in B it is a straight line. This is because the capital endowment of B happens to have a ratio of capital to labour which is equal to one of the ratios at which the capital-intensity curves of food and clothing intersect, as shown in Fig. 1 (viz., the inter-section where the rate of interest $= r^b$). In this exceptional case both industries, food and clothing, are subject to *constant* costs in the strict sense. Neither industry has a greater capital intensity than the other, and consequently it is possible to switch resources and output between them without altering the value of capital relative to labour. Thus neither their methods of production nor the cost (nor price) ratios of their products will be altered as the switch occurs. The production-possibility function of a country is normally concave to the origin, because one or other of the two industries is normally more capital intensive.[1]

I hope that it is intuitively obvious that an intersection of the curves of Fig. 1 cannot lie within a range of other production possibilities in any single country. If a country can have a rate of interest at which these

[1] The reasons for the normal concavity of the production-possibility function and its linearity in exceptional cases are both explained fully in "Notes on Supply," pp. 240–1, by R. F. Harrod, Economic Journal, June 1930; reprinted in *Economic Essays*, pp. 86–8. The proof there given strikes me as conclusive, but I am told that mathematical economists prefer a greater proliferation of symbols in a proof. (Do *pure* mathematicians?)

curves intersect, then it can have no other; this will be its unique rate of interest, whatever combination of food and clothing production it chooses. The whole range of the production possibilities will be nothing more than an expansion of the single point of intersection of the curves in Fig. 1. Any country whose capital/labour endowment ratio is other than one represented by an intersection of the curves in Fig. 1 will *either* be more capital intensive in the production of food throughout its *whole* range of production possibilities *or* more capital intensive in the production of clothing, throughout its *whole* range of production possibilities. In either case the curve of its production possibilities will be concave to the origin.

It may be well to stress this point, since lack of thorough understanding of it could be a reason for failure to notice the possibility (even probability) of the same commodity being capital intensive in comparison with some other standard commodity in one country and labour intensive by comparison with that same (standard) commodity in another. If in any equilibrium position commodity Y is capital intensive by comparison with a (standard) commodity X in country A, it must be capital intensive for every possible equilibrium position whatever in country A, assuming, as is reasonable, continuity of the production-possibility function. If for one distribution of A's productive resources Y is capital intensive, Y must be capital intensive however A distributes its productive resources throughout the range of possible distributions, viz., from no production of X to no production of Y. Thus residents of country A, including even economists, seeing that Y is capital intensive at home, however much or little of Y is produced, may fall into the view that Y is *per se* more capital intensive than X. But this is a myopic view. Y may in fact be more labour intensive than X in some other country, say C, but, if it is, it must be more capital intensive throughout the range of C's production possibilities, so that the residents of C may fall into the opposite illusion that Y is *per se* more labour intensive.

The reason why each country is thus limited and must throughout its range show one or other commodity as uniformly capital intensive, although the commodity may not be uniformly capital intensive in the world as a whole, is that to get from a production pattern in which Y is more capital intensive to one in which it is more labour intensive, one has to pass a point at which Y is neither. But if Y were neither capital intensive nor labour intensive at any one point on the country's production-possibility function, it would necessarily be neither at all points on its function (as in B and D in Fig. 2). Thus this point creates an unbridgeable gulf between two countries. Only if factors of production were perfectly mobile internationally, would Y be *either* more labour intensive *or* more capital intensive throughout the world.

We now come to country C, the condition of which contains the key to the argument against Professor Samuelson. Its capital endowment is

such that, however much food or clothing it produces, its rate of interest will be between $r^b$ and $r^d$. In all this range of interest rates the optimum method of producing clothing will be more capital intensive than the optimum method of producing food. Consequently, in diametrical opposition to the conditions in countries A and E, the interest rate in C will be lowest when it is producing all food. Whereas in countries A and E, when we proceed from the top left to the bottom right, the rate of interest falls, in country C, when we proceed from the top left to the bottom right, the rate of interest *rises*. When we go over from the production of food to the successive production of more clothing the rate of interest must rise, because in C clothing is the more capital intensive of the two commodities.

The gradient of the production-possibility curve at any point measures the cost of clothing in terms of food at that point, viz., the number of units of food that have to be surrendered to obtain one unit of clothing. If commodity cost ratios are to be equal in the two countries, A and C, and both countries are to produce some of each commodity, there must be some point (or points) on A's production-possibility curve where the gradient is equal to the gradient at some point (or points) on C's. Were it not for the intersection of the curves in Fig. 1 the gradient of the curve for country C would be greater, throughout its length, than the gradient of the curve for country A at any point; that would give Samuelson's 100% specialisation; the cost of clothing in terms of food would be higher in C, however much of food or clothing A and C produced. But, given the intersection, there will be a number of gradients on A's curve corresponding to which equal gradients may be found on C's curve. These are points of possible equilibrium with foreign trade.

Let us suppose that the two countries are insulated. Ordinary supply and demand analysis determines how much of food and clothing will be produced in each country (X in Fig. 2). Suppose that the cost (= price) of clothing in terms of food is greater in C than in A, when both are insulated. If trade is opened C purchasers will buy clothing from A, and its cost will rise in A while its cost in C (owing to diminished production) falls. At the same time the A purchasers will buy food from C, where its cost will rise in consequence, while that in A falls. The movement rightwards will proceed along the production-possibility curve of A (as shown in figure), which gets progressively steeper, and the movement leftwards will proceed along the production-possibility curve of C, which gets progressively flatter, until the two gradients come to equality.

It is to be observed that, wherever production settles down in the two countries in consequence of trade, the rate of interest will remain lower in C, since it is lower there however its resources are divided between food and clothing. We may be sure that wages (not shown in the diagram) will be higher in C than in A, since labour in C is more highly endowed with capital. Thus we have trade between the countries, causing an equalisation

of commodity prices, but no equalisation of factor prices. The trade will tend to lower interest and raise wages in *both* countries, since in both countries there is a movement towards the commodity which in its own country is less capital intensive. If in the no-trade position the gradient had been steeper in A, then A would have exported food in exchange for clothing, and interest rates would have risen and wages fallen in both countries. (These relations, be it noted, are very damaging to the Ohlin approach.)

There will also be opportunities of trade with E, as shown in the figure. But in E the consequence of trade will be a *rise* in the rate of interest.

The curves have been drawn so that almost all rates of interest are represented on the production functions of one or other of the countries. Thus as A goes over to clothing, the rate of interest falls almost to $r^b$. It cannot quite fall to $r^b$, since, if it did, A would be identical with B and its production function would be linear.

On the assumption that the rate of interest falls almost to $r^b$, as A goes over towards all clothing, the (linear) production function of B is almost parallel to the lowest portion of the production function of A. Making a similar assumption in regard to C, namely that her rate of interest *rises* almost to $r^b$ as she goes over towards all clothing, the lowest portion of her production function is almost parallel to the (linear) function of B and to the lowest portion of the production function of A. By similar assumptions and reasoning the (linear) production function of D is almost parallel to the highest section of the production function of C and also to the highest section of the production function of E.

On these assumptions *either* there will be, for every point on the function of C, a point having an equal gradient on the function of A, *or* there will be, for every point on the function of A, a point having equal gradient on the function of C. Similarly, *either* there will be, for every point on the function of C, a point with equal gradient on the function of E *or* there will be, for every point on the function of E, a point having equal gradient on the function of C. Thus there will be plenty of opportunities for free trade without 100% specialisation, and, of course, equalisation of factor prices is, in the circumstances, not only not necessary, but also impossible.

It is not compulsory to draw the figure in this way. It might happen that there were gaps, with some rates of interest not represented on the production-possibility functions of any of the countries. There is no reason to suppose that this would reduce the opportunities for profitable trade with incomplete specialisation.

It need hardly be added that there is nothing in the essential nature of this analysis to lead to the conclusion that the poorest country is likely to export clothing, which happens to be the less-capital intensive of the two commodities for a very poor country. Which way the trade will flow between A and C depends on: (*a*) the comparative amounts of curvature of

their two production possibility curves, and (*b*) the ways in which the countries A and C divide their resources between food and clothing, when insulated. In my drawing the curve of A has more curvature than that of C, and that is why at approximately the mid-point of the curve the price of clothing is higher in C than in A. There is no *a priori* reason why the C curve should not have more curvature than that of A.

If there were such countries as B and D it seems that B would specialise completely in food and D in clothing; but it is unlikely that there will be any such countries.

If factors were perfectly mobile between countries, then the whole world would be in the position either of an A-type country or of a B-type country or of a C-type country. The rate of interest might be established for the world at a point of intersection of the capital-intensity curves of food and clothing, in which case both those commodities would (on the two-factor assumption) be subject to constant costs throughout the world. Otherwise the rate would either lie in a range in which food was more capital intensive or in one in which clothing was more capital intensive. Thus if, for one distribution of world productive effort between food and clothing, food was more capital intensive, it would be more capital intensive for every possible distribution—given, of course, the world capital and labour endowment and the state of technology that happened to prevail at the time. That is the Samuelson postulate that we have challenged in this article. For the world as a whole, if there is complete mobility of factors, the realisation of Samuelson's postulate is the *consequence* of factor–price equalisation (which is due to the complete mobility of factors) throughout the world; but the realisation, if there is not complete mobility, is improbable.

It may be that the foregoing demonstration is concerned with a condition, viz., the number of factors not more than the number of commodities, which is not likely to be realised. I believe that the true explanation of the flow of trade springs from the number of commodities, broadly defined, as is proper for this purpose, being less than the number of factors, owing to the existence of at least one specific factor for every commodity so defined. But it is satisfactory to know that, even on the wire-drawn hypothesis of two factors and two commodities, the Samuelson conclusion holds only on the unlikely assumption, which it is fair to say that he himself recognised as required, that the curves of factor intensity never intersect. This assumption is even less likely to be fulfilled if there are more than two factors and commodities.

I conclude that the Samuelson case of the alternatives of equal factor prices or 100% specialisation is a *curiosum* in international trade theory, and should be presented as such, rather than as a fundamental principle or as an analysis of any probable development.

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*Oxford.*

# DYNAMIC DEMAND FUNCTIONS: SOME ECONOMETRIC RESULTS [1]

## I. Introduction

The purpose of this article is to present some results of applying a dynamic model of consumers' behaviour. These applications relate mainly to the quarterly series of consumers' expenditure in the United Kingdom for the postwar period 1950–56, but it is also shown that these results may be combined with the information obtained from interwar time series and family budgets. Both durable and perishable commodities are treated, and some extensions of a model previously presented [2] are made.

The nature of this model may be broadly characterised in the following terms. It is evident that in the case of durable goods what consumers really demand is a stock of such goods which they can consume by using them. For example, we do not demand a daily purchase of new clothes, but the daily use of a given stock of clothes in our wardrobe. It may be said that consumers are in equilibrium when, at their given real income and at the given relationship between the price of this good and of other goods, they are content with holding the stock which they are in fact holding. When they are out of equilibrium, when, for example, the stock they hold is less than the stock which they would like to be holding, they will increase their current purchases of the good in order to build up their stock at a certain rate to the desired level; and it is probable that they will attempt to build up their stock the more quickly, the larger is the divergence between the stock which they are in fact holding and the stock which at current prices and real incomes they would like to hold. In the real world it is possible to observe only the current purchases of the good by consumers, and these purchases are partly for the replacement of their stocks as they are used up and partly for the expansion of their stocks. But it is the argument of the following sections of this paper that if reasonable assumptions are made about the durability of the good in question, then from the data of current purchases, prices and real incomes it is possible to derive estimates of the stocks held, of the stocks which consumers would like to hold and of the rate at which consumers adjust their actual stocks towards the level of their desired stocks. Estimates may be made for each durable good, first, of the effect which a change in real income or in relative prices would have upon the size of the equilibrium stock of that good which consumers would like to hold and, second, of the speed with which consumers attempt to adjust their

[1] In the preparation of this paper we have received a number of most helpful suggestions from Dr. S. J. Prais.

[2] Stone, Richard, and Rowe, D. A., "The Market Demand for Durable Goods," *Econometrica*, Vol. 25, No. 3, July 1957, pp. 423–43.

actual stocks to this equilibrium level when there is a discrepancy between the actual and the equilibrium levels of their stocks. In this way it is possible to construct demand functions which are based on the assumption that the consumers' purchases of such products are undertaken for the purpose of adjusting their stocks of the durable product at a certain rate to the stocks which, in current market conditions, they would wish to hold.

Purchases of perishable goods in this model are always used up immediately, and there is no possibility of accumulating stocks of these goods; that is, purchases and consumption are the same. Consumers are out of equilibrium in respect to their consumption of perishables when there is a discrepancy between their actual purchases of these goods and the purchases they would like to be making at the given levels of real income and relative prices. As for durable goods, it is reasonable to suppose that the speed of the adjustment will be in proportion to the size of the discrepancy. The demand function is then essentially the same as that for durables.

In the following section the model is given a specific form and the basic regression equations are derived. The actual regression results obtained for the postwar period are discussed in Section III. Comparisons with results for the interwar period are presented in Section IV, and a final section draws some conclusions from the analysis.

## II. A Dynamic Model of Consumer Demand

The simple dynamic demand model to be applied in the following sections is formulated in terms of a durable commodity. A perfectly perishable commodity appears as a special limiting case in which the degree of durability is reduced to zero. The exposition takes the form of a period analysis; in any particular application the relevant period, whether a year, three months or one month, will be determined by the data.

It is supposed that for any durable commodity the purchases (or gross investment) of a period, $q$, may be regarded as the sum of two components representing an amount, $u$, of consumption (or depreciation) during the period, and an amount, $v$, of net investment:

$$q = u + v \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The net investment, $v$, is by definition the net addition made to the opening stock, $s$, during the period, or

$$Es = s + v \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where $E$ is an operator such that $E^{\theta}x(t) = x(t + \theta)$. $Es$ is thus the closing stock of the current period and, equally, the opening stock of the following period. Consumption is simply the using up of the available stock, and it is assumed that this proceeds at a constant proportionate rate. In each period, therefore, consumption is a certain proportion, $1/n$, of the opening stock

*plus* an equal or smaller proportion, $1/m$, of the purchases of the period. That is,

$$u = s/n + q/m \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

If purchases are made only at the outset of the period, the rate of consumption out of purchases will be the same as for the opening stock, and in this case $m = n$. It is more reasonable to assume, however, that purchases will be spread through the period, with the result that a smaller proportion has been consumed by the end of it, that is $m > n$. The value of $m$ will be given by some function of $n$, depending on the manner in which purchases are distributed over the period. For all practical purposes it may be assumed that purchases are spread evenly through the period, and in this case the value of $m$ is given approximately by the formula

$$m = 2n - 1/3 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

It may also be shown that, given the assumption of a uniform rate of purchase, the average level of stocks during the period, $\bar{s}$, is a simple weighted average of the opening and closing stocks:

$$\bar{s} = \frac{n}{m} Es + \left(1 - \frac{n}{m}\right)s \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

In this system of relationships the only quantities that may be actually observed are the purchases, $q$. The rest are implicit in the definitions. Given the value of $n$, it may readily be seen that these equations are sufficient to determine each of the other series. Combining equations (1) to (3), the opening stock may be expressed as a weighted sum of all past purchases; that is,

$$s = \frac{n(m-1)}{m(n-1)} \sum_{\theta=1}^{\infty} \left(\frac{n-1}{n}\right)^{\theta} E^{-\theta} q \quad . \quad . \quad . \quad . \quad (6)$$

If $s$ is known, then $u$ may be determined from (3) and, consequently, $v$ from (1). Although equation (6) implies that all past purchases must be known to determine $s$, the weights become so small for the remoter values that in practice only a limited sequence is required.

The essentially dynamic character of the model derives from a distinction between the actual level of stocks and the desired or equilibrium level, $s^*$, depending on income and prices. It is assumed that consumers will seek to adjust their average level of stocks to the desired level but that in general this adjustment will not be accomplished in a single period. Different rates of adjustment will characterise different commodities. A specific form of this behaviour is expressed by the equation:

$$\bar{s} - s = r(s^* - s) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

Here it is implied that in each period consumers will act so as to raise (lower) the average level of stocks, $\bar{s}$, above (below) the quantity actually

held, $s$, by a proportion, $r$, of the discrepancy between $s$ and the desired level, $s^*$. If $s^*$ remains constant the average level of stocks will approach closer to this desired level in each successive period. The speed of this process of adjustment will depend upon how near to unity is the value of the parameter $r$.

An alternative formulation of this same general pattern of behaviour may be obtained by replacing the absolute values of each of the variables in (7) by their logarithms. In absolute terms this is equivalent to

$$\frac{\bar{s}}{s} = \left(\frac{s^*}{s}\right)^r \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

which is the form adopted for the present applications. Substituting for $\bar{s}$ from (5), equation (8) may be rearranged to give

$$v = \frac{ms}{n}\left\{\left(\frac{s^*}{s}\right)^r - 1\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$$

in which the net investment of the period, $v$, is shown explicitly. If this expression for $v$ is substituted in the definitional equations (1) to (3), the comparable formulations of consumption and purchases are also obtained. That is,

$$u = \frac{m}{n(m-1)}(s^{*r}s^{1-r}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

and

$$q = \frac{m^2}{n(m-1)}(s^{*r}s^{1-r}) - \frac{ms}{n} \quad . \quad . \quad . \quad . \quad . \quad (11)$$

In equation (10) consumption is shown to be a certain proportion of a weighted geometric average of the equilibrium stock and the opening stock. This equation is the one most suitable for regression purposes, since it is of simple linear form when converted to logarithms.

To complete the model it is necessary to specify the dependence of $s^*$ on income and prices. This may be written

$$s^* = a\rho^b(p/\pi)^c e^{gt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

where $\rho$ is real income (or total expenditure), $p/\pi$ is the relative price of the commodity and $t$ is a linear trend. Equations (10) and (12) together give,

$$u = a'\rho^{br}(p/\pi)^{cr}e^{grt}s^{1-r} \quad . \quad . \quad . \quad . \quad . \quad (13)$$

which is taken as the basic form for the regressions of the following sections. In this equation the coefficients $br$ and $cr$ represent the short-period income and price (substitution) elasticities for consumption. They are termed short-period elasticities because they reflect the immediate adjustment to income and price changes within the unit period. If income and price levels remained unchanged in subsequent periods, consumers would ultimately adjust to the equilibrium position, where $s = s^*$ and, as may be seen

from (10), consumption is proportionate to $s^*$. Thus the coefficients $b$ and $c$ may be regarded as the long-period income and price (substitution) elasticities. It is also evident that in equilibrium net investment is nil and purchases are equal to consumption, so that the long-period elasticities for purchases are the same as those for consumption. The short-period elasticities for purchases take the form $brmu/q$ and $crmu/q$ with respect to income and prices respectively. For small variations from an equilibrium position, when the ratio of consumption to purchases is unity, they will have the constant values $brm$ and $crm$.

The durability of a commodity determines the magnitude of the parameter $n$. Since the depreciation process involved is essentially of the reducing balance form, it is implied that no durable commodity is ever wholly used up. It is convenient to have a measure, $n^*$, of the number of periods taken for 90%, say, of a purchase to be consumed. This is given to a close approximation by the formula:

$$n^* = 2{\cdot}3n - 1{\cdot}2 \quad . \quad . \quad . \quad . \quad . \quad . \quad (14)$$

Perishable commodities are, by definition, always wholly consumed within the unit period ($m = n = 1$), and there is neither net investment nor stocks. This is the limiting case of zero durability, with consumption identically equal to purchases. It leads to a consumption equation very similar to (13), in which the opening stock is replaced by the consumption of the previous period. That is,

$$u = a\rho^{br}(p/\pi)^{cr}e^{grt}(E^{-1}u)^{1-r} \quad . \quad . \quad . \quad . \quad . \quad (15)$$

In practical applications it will usually be necessary to assume a value for $n$ *a priori*, since little information is available on the depreciation of consumer goods, although in special cases it may be possible to determine this parameter directly from the data.[1] The value of $m$ can then be calculated on the assumption that purchases are spread evenly through the unit period. The values of $r$ and the other coefficients may be determined by regression analysis on the basis of equations (13) or (15).

The parameters $n$, $m$ and $r$ are essentially time rates, and will vary with the length of the unit period adopted. Both annual and quarterly data are used in the present applications, but the results have been standardised to an annual basis for the comparisons made in Section IV. Similarly, attention is concentrated on the long-period elasticities with respect to income and prices, since these may be regarded as the basic structural parameters independent of the time scale.

[1] Cramer, J. S., "The Depreciation and Mortality of Motor Cars," paper read to the Royal Statistical Society, December 17, 1957, to be published in the *Journal of the Royal Statistical Society*.

## III. Estimated Demand Functions for the Postwar Period

The estimated demand functions have been fitted to quarterly data for the period 1950–56.[1] Only the broad groups of consumers' expenditure are treated; sufficient information is not readily available to carry out the analysis on anything like a commodity basis. Although wholly free-market conditions never obtained, for the rationing of domestic coal persists to the present day, the period chosen excludes a large part of the disturbances connected with postwar shortages, rationing and price control. Even so, not all the commodity groups in the published statistics could be successfully analysed. The rationing of food continued into 1954, and it was not to be expected that an adequate demand equation could be fitted to the quarterly data for this period. The groups covering " travel " and " other goods and services " are both probably too heterogeneous to yield reasonable results from an aggregate analysis. No analysis was attempted for the group "housing," since the operation of rent control and the inadequacies of the data combine to render this item quite unsuitable for the present purpose. The eight groups for which reasonable results have been obtained are: beer, other alcoholic drink, tobacco, fuel and light, durable household goods, footwear, other clothing and entertainments. In addition, it has been possible to analyse separately the two component groups of household durables; that is, furniture and furnishings, and hardware, radio and electrical goods.

The fitting procedure adopted is that of ordinary least squares regression, which has been applied to the logarithmic forms of equations (13) and (15). To remove, as far as possible, any serial correlation in the observed residuals, the logarithmic series were converted to first-differences before fitting. A particular problem involved in the use of quarterly series is the presence of purely seasonal shifts in consumption. These are treated here as short-term, systematic changes in tastes, similar in character to the residual trend factor included in the specification of the equilibrium stock function (12). For the present purposes each of the regression variables, that is the first differences of the logarithmic series, has been adjusted by deducting from each observation the corresponding quarterly mean. Accordingly, no seasonal or trend coefficients are shown in the results of the analyses given below. The procedure is formally equivalent to the inclusion of " dummy " trend and seasonal variables in the basic equation, and is adopted for greater simplicity in computing.[2]

Much of the seasonal variation in consumption will be associated with changes in weather conditions. It is probable, therefore, that deviations from the average seasonal pattern of weather variation will also have a

[1] Central Statistical Office, *Monthly Digest of Statistics*, H.M.S.O., London.

[2] Stone, Richard, *Quantity and Price Indexes in National Accounts*, Organisation for European Economic Co-operation, 1956.

significant influence upon certain items of consumption. These effects, moreover, are much more likely to show up in quarterly data than they would in annual averages. To take account of this, three weather factors were introduced into the analysis: temperature, rainfall and sunshine. Specifically, the three variables used are: the daily mean air temperature at sea-level in degrees Fahrenheit, the average monthly rainfall in inches and the mean hours per day of sunshine. The quarterly averages for England and Wales, Scotland and Northern Ireland [1] were combined, using weights roughly proportional to the population. It was not thought necessary to convert these series to logarithms, but, as for the other regression variables, the seasonally adjusted first-differences were used.

A further possible extension to the specification of equilibrium stocks in equation (12) is the introduction of lagged variables. It is possible, for instance, that the desired level of stocks is determined not only by current income but also by the experience of the recent past. In the simplest case this would lead to the replacement of $\rho$ by a new variable $\rho^*$, which is a weighted (geometric) average of income in the current and immediately preceding period. That is,

$$\rho^* = \rho^{\eta}(E^{-1}\rho)^{1-\eta} \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

The value of $\eta$ may be determined from the regression. It will normally be some positive fraction, implying that the effective income level is a simple average of the two periods. It is possible, however, that it may take a value greater than unity, indicating that consumers are influenced by some extrapolation of past income experience. A similar treatment of prices is possible, which lends itself to an interpretation in terms of expectations. For the quarterly data analysed here, however, no significant reaction to lagged prices could be found.

The results of the analyses are set out in Table I, which shows the regression coefficients obtained for the basic equation (13) or (15), including the additional variables discussed in the preceding paragraphs where these proved to be significant. An initial column of this table shows the values of $n$ assumed for the analyses. They are the reciprocals of the quarterly rates of depreciation and indicate that purchases of clothing and footwear are on average written down to 10% of their value in a little less than one year and a half, while the corresponding figure for household durables is approximately eight years. The values of $n$ have simply been assumed *a priori* for the purpose of the present analysis, but there is some evidence from interwar data in support of the value chosen for household durables.[2] The other commodities, alcoholic drinks, tobacco, fuel and light and entertainments, are treated as being perfectly perishable. The goodness of fit obtained in each case is shown by the square of the multiple correlation

[1] Central Statistical Office, *Annual Abstract of Statistics*, H.M.S.O., London.

[2] Stone, Richard, and Rowe, D. A., "The Market Demand for Durable Goods," *Econometrica*, Vol. 25, No. 3, July 1957, pp. 423–43.

coefficient, $R^2$, in the last column but one. For the durable commodities a particularly high proportion of the observed variation has been explained, not less than 90% in each case. It must not be forgotten, however, that these figures apply to the derived series of consumption, $u$, and that for the actual purchases, $q$, the figures are necessarily lower. On the other hand, that part of the original variance due to seasonal factors has not been taken into account here, and this reduces the apparent degree of explanation obtained. The final column of the table gives the value of Durbin and Watson's

TABLE I

*Consumption Functions for the United Kingdom*, 1950–56

| Commodity. | $n$. | Coefficient with respect to | | | | | | $R^2$. | $d$. |
|---|---|---|---|---|---|---|---|---|---|
| | | $\rho$. | $E^{-1}\rho$. | $p/\pi$. | $E^{-1}u$ or $s$. | Temperature. | Rainfall. | | |
| 1. Beer | 1 | 0·68 (0·33) | — | −0·53 (0·22) | −0·31 (0·15) | 0·79 (0·28) | −0·85 (0·43) | 0·81 | 2·43 |
| 2. Other alcoholic drink | 1 | 3·23 (0·81) | — | 1·52 (0·95) | −0·47 (0·12) | — | — | 0·74 | 2·40 |
| 3. Tobacco | 1 | 1·00 (0·25) | — | −0·78 (0·35) | −0·20 (0·15) | — | — | 0·48 | 1·85 |
| 4. Fuel and light | 1 | −0·06 (0·44) | — | −0·66 (0·33) | −0·10 (0·18) | −0·76 (0·33) | — | 0·60 | 2·06 |
| 5. Durable household goods | 14·41 | 0·15 (0·02) | 0·05 (0·02) | −0·014 (0·021) | 0·91 (0·05) | — | — | 0·96 | 2·13 |
| 6. Furniture | 14·41 | 0·16 (0·02) | 0·05 (0·03) | −0·012 (0·023) | 0·88 (0·05) | — | — | 0·97 | 2·42 |
| 7. Hardware | 14·41 | 0·10 (0·03) | 0·02 (0·03) | −0·06 (0·02) | 0·95 (0·07) | — | — | 0·93 | 2·03 |
| 8. Footwear | 3·02 | 0·25 (0·08) | 0·24 (0·09) | −0·08 (0·06) | 0·69 (0·07) | — | — | 0·91 | 2·25 |
| 9. Other clothing | 3·02 | 0·44 (0·08) | — | −0·09 (0·08) | 0·73 (0·06) | — | — | 0·90 | 1·57 |
| 10. Entertainments | 1 | (0·42) (0·35) | — | −0·33 (0·23) | (0·29) (0·20) | 0·41 (0·25) | — | 0·47 | 2·36 |

$d$-statistic [1] for each analysis, indicating the degree of serial correlation in the observed residuals. A value close to 2 for this statistic indicates a relative absence of serial correlation, but there are at present no precise tests of significance readily available for analyses employing the number of determining variables used here.

Estimates of personal disposable income are not available on a quarterly basis for this period, and the series for $\rho$ used in the analysis is total expenditure at constant prices. The coefficients of $\rho$, $E^{-1}\rho$, and $p/\pi$ shown in the table are the short-period (quarterly) elasticities with respect to total expenditure in the current and preceding period and the relative price, respectively. For the perishable commodities only the level of current expenditure is relevant, that is, $\eta = 1$. For each of the durable commodity groups except clothing, however, a value of $\eta$ less than unity is obtained. The short-period elasticity with respect to $\rho^*$ is given by the sum of the coefficients for $\rho$ and $E^{-1}\rho$, and the estimate of $\eta$ is the ratio of the coefficient for $\rho$ to this sum. For the household durables values of approximately

[1] Durbin, J., and Watson, G. S., "Testing for Serial Correlation in Least Squares Regression," *Biometrika*, Vol. 37, Parts 3/4, December 1950, pp. 409–28, and Vol. 38, Parts 1/2, June 1957, pp. 159–78.

three-quarters are found; for footwear it is one-half. If these values are considered as indications of lag, the magnitudes involved are quite small, being no more than three weeks and six weeks respectively. It is unlikely that small lags of this order could be satisfactorily estimated from annual data. The reactions involved are nevertheless of some importance for the short-term forecasting of sales.

The short-period elasticities given here are, of course, only consumption elasticities. For durable goods, as was shown in the preceding section, the elasticities of demand, or purchases, are different, and in general are not constant. For positions near to equilibrium, however, they approximate to a simple multiple of the consumption elasticities. The multiplying factor is the parameter $m$, which will normally be quite large; in the present case it is 5·7 for clothing and footwear and 28·2 for household durables. The short-period demand elasticities are therefore fairly considerable, particularly with respect to total expenditure. The marked difference between the demand and consumption elasticities is due to the fact that it requires a large initial purchase to increase the rate of consumption by even a small proportion for a good of any considerable durability.

The coefficients of $E^{-1}u$, or $s$, shown in the table are equal to $(1-r)$, where the parameter $r$ is associated with the rate of adjustment to the equilibrium position. For each of the durable groups the value of $r$ is found to be a relatively small fraction, indicating that the rate of adjustment to an equilibrium position is fairly slow for these goods. For perishable goods, $r$ is much closer to unity, and adjustment is correspondingly more rapid. In fact, except for beer and other alcoholic drink, the values do not differ significantly from unity, and it might be reasonable to assume that for most perishables there was practically no delay in adjusting to the equilibrium position. In so far as there is a divergence, it would seem that the immediate reaction tends to be in excess of the required adjustment ($r>1$). This pattern of behaviour is not necessarily implausible. It suggests that with a rise in real income, for example, the demand for certain readily consumed perishable commodities increases temporarily to a higher level than is subsequently maintained, when consumers have adjusted to a new standard of living involving the maintenance of a larger stock of durable goods. Conversely, for a decrease in income, immediate cuts in the consumption of perishable goods are more easily made.

A significant effect due to variations in temperature or rainfall is found for each of the perishable commodities except tobacco. The coefficients are not elasticities in this case, but represent, approximately, the percentage change in consumption associated with a unit change in the weather variable. In the present analysis the changes in both cases relate to deviations from the seasonal average. The results are plausible, and for beer and for fuel and light the factors included account for a considerable proportion of the observed variation.

## IV. Comparisons with the Interwar Period

The demand equations for the postwar period presented here are based on the data for seven years only. Although the use of quarterly data increases the number of observations fourfold, the amount of significant variation is not necessarily proportionately enlarged. There is a double interest in making a comparison with the results obtained from interwar data. It may be asked how far the structural parameters of demand are stable over a period of some forty years, and whether they can be adequately determined from a short span of only seven years.

The structural stability of demand may be considered in a number of different aspects. It will be examined here in terms of the long-period elasticities with respect to total expenditure and prices, the parameters $b$ and $c$ of the regression equation, and also with respect to the adjustment parameter $r$. An apparent stability in these elements alone is no proof that there have not been considerable shifts in consumers' patterns of response. There may have been, for instance, systematic changes of tastes only apparent as long-term trends, or variations of seasonal behaviour, or even marked discontinuities in the average level of consumption as a result of war-time experience, which have left unchanged the particular factors to be considered here.

Comparable results for the earlier period are obtained from two sources: the annual time series of consumers' expenditure for the years 1920–38,[1] and the family budget data collected for the working-class [2] and middle-class [3] inquiries of 1937–39. Estimates of the three parameters, $b$, $c$ and $r$, were obtained from the time series; from the budget data only an estimate of the expenditure elasticity, $b$, was available. The estimates from each of the three sources are shown together in Table II. For this purpose the values of the parameter $r$ obtained from the postwar quarterly series have been adjusted to an annual rate.

The methods of estimation employed for the earlier period need only be briefly outlined here. Dynamic equations of the same basic forms as those derived in Section II were applied to the time series, and the same rates of depreciation as for the postwar period were assumed for the durable commodities. It would have been of interest to discover whether there was any evidence of a change in these rates, but this did not seem possible with the data available. It seems unlikely that the changes would be large for the aggregate groups treated here. The auxiliary variables

[1] Stone, Richard, and Rowe, D. A., *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920–1938, Vol. II*, Studies in the National Income and Expenditure of the United Kingdom, 2, Cambridge University Press, forthcoming.

[2] Ministry of Labour, *Weekly Expenditure of Working-Class Households in the United Kingdom in 1937–38*, mimeographed, July 1949.

[3] Massey, Philip, "The Expenditure of 1360 British Middle-Class Households in 1938–39," *Journal of the Royal Statistical Society*, Vol. CV, 1942, Part III, pp. 159–96.

specified in the analyses were not always the same. Neither the influence of the weather variables nor the small lags in the effective level of expenditure could be detected with the annual data.

The Engel curves fitted to the budget data were of the common double-logarithmic form, implying a constant elasticity throughout the whole range of expenditure. A simple "dummy" discontinuity variable was included to take account of differences between the average levels of expenditure in the two social classes.

TABLE II

*Alternative Estimates of the Structural Parameters*

| Commodity. | *b.* | | | | *c.* | | | *r.* | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1950–56. | 1921–38. | 1937–39. | Combined. | 1950–56. | 1921–38. | Combined. | 1950–56. | 1921–38. | Combined. |
| 1. Beer | 0·52 (0·26) | −0·07 (0·29) | 2·31 (0·21) | — | −0·40 (0·20) | −1·11 (0·11) | — | 1·06 (0·02) | 0·87 (0·07) | — |
| 2. Other alcoholic drink | 2·18 (0·61) | 1·93 (0·47) | 2·31 (0·21) | 2·24 (0·20) | 1·05 (0·67) | −1·05 (0·14) | — | 1·08 (0·01) | 1·45 (0·21) | 1·08 (0·01) |
| 3. Tobacco | 0·83 (0·24) | 0·74 (0·13) | 0·65 (0·13) | 0·71 (0·09) | −0·65 (0·28) | −0·65 (0·14) | −0·65 (0·13) | 1·04 (0·03) | 1·02 (0·11) | 1·04 (0·03) |
| 4. Fuel and light | −0·05 (0·40) | 1·50 (0·41) | 0·39 (0·04) | — | −0·61 (0·27) | −0·09 (0·15) | −0·21 (0·13) | 1·02 (0·04) | 1·28 (0·07) | — |
| 5. Durable household goods | 2·21 (1·31) | 2·42 (1·18) | 2·35 (0·27) | 2·35 (0·26) | −0·16 (0·30) | −0·97 (0·48) | −0·39 (0·27) | 0·30 (0·15) | 0·15 (0·07) | 0·18 (0·07) |
| 6. Furniture | 1·76 (0·81) | 2·08 (0·63) | 2·49 (0·29) | 2·35 (0·27) | −0·11 (0·23) | −1·18 (0·30) | — | 0·38 (0·13) | 0·16 (0·05) | 0·19 (0·05) |
| 7. Hardware | 2·36 (3·25) | 2·33 (0·84) | 1·64 (0·24) | 1·70 (0·24) | −1·24 (1·82) | −0·21 (0·18) | −0·23 (0·18) | 0·19 (0·23) | 0·23 (0·07) | 0·22 (0·07) |
| 8. Footwear | 1·60 (0·44) | 0·51 (0·48) | 0·77 (0·07) | 0·79 (0·07) | −0·26 (0·21) | −0·19 (0·21) | −0·22 (0·16) | 0·71 (0·08) | 0·65 (0·16) | 0·69 (0·08) |
| 9. Other clothing | 1·65 (0·47) | 1·52 (0·25) | 1·41 (0·08) | 1·43 (0·08) | −0·34 (0·34) | −0·40 (0·14) | −0·39 (0·13) | 0·66 (0·09) | 0·62 (0·05) | 0·63 (0·05) |
| 10. Entertainments | 0·33 (0·30) | 0·78 (0·88) | 1·82 (0·13) | — | −0·25 (0·19) | −0·81 (0·26) | −0·52 (0·19) | 1·06 (0·03) | 0·92 (0·21) | 1·05 (0·03) |

* All drink.

The coverage of the interwar groups does not always coincide exactly with the classification of the postwar data. In particular, the composition of the two sub-groups of durable household goods differs slightly between the two periods. In the interwar analyses gramophones, radios and television sets are included in the furniture group, while for the postwar series they are included with hardware. In other groups the differences involve merely marginal items and can be the cause of only small discrepancies.

For each of the estimates shown in Table II the sampling error involved has been calculated and is indicated in the usual way by the standard error, which is included in brackets beneath the estimated value of the parameter. The degree of precision attained differs significantly for the different sources of information. The expenditure elasticity, $b$, is generally determined much more exactly from the budget data than from the time series. This is a natural consequence of the greater range of expenditure covered by the budget information. The annual time series usually give the better estimate of the price (substitution) elasticity, $c$, while the adjustment parameter, $r$, appears to be more accurately known from the quarterly series.

It is an assumption of the present approach that the estimates of the long-

period expenditure elasticities obtained from the time series and from the budget data are theoretically equivalent; that is, both measure the long-run dependence of consumption on the level of total expenditure. Similarly an estimate of the long-period price (substitution) elasticity or of the adjustment parameter $r$ may be made equally from annual or quarterly data. These alternative estimates may be compared by testing the hypothesis that the observed differences could have arisen as merely sampling errors. If the estimates are found to be significantly different, it may be concluded that the magnitude of the parameter has changed in the course of time or, possibly, that there is some underlying theoretical incompatibility between the different measures. Where there is no significant difference between the alternative estimates a single combined value of increased precision may be calculated using the information available from all sources. The statistical procedures required have been set out by Cochran.[1]

The combined values of the parameters are also shown in Table II. In the eight instances where the original estimates were found to be significantly different no combined value has been given. In all other cases it is reasonable to assume that the differences between the estimates are due to sampling errors and that the underlying consumer reactions have remained unchanged. In many cases, of course, these sampling errors are large, and it is possible that if more accurate measurements could be made significant differences would be revealed. From the evidence of the present analyses, however, the predominant impression is one of general uniformity. In a few instances, tobacco and clothing, for example, the agreement between the alternative estimates is striking.

In only one instance, beer, is it found that all three parameters are significantly different in the two periods. For this commodity, however, the interwar results are unsatisfactory for a number of reasons. The total expenditure elasticity obtained from the time series has an improbable negative value, which is, however, much smaller than its standard error. The budget elasticity, moreover, relates to expenditure not only on beer but on all alcoholic drinks. Budget information on the consumption of alcoholic drink is notoriously inadequate, and it is probable that this figure is more representative of other drinks than of beer, which was more rarely consumed in the home. Furthermore, the adjustment parameter, $r$, obtains a value significantly less than unity in this period, contrary to all other findings for perishable goods in the present analysis. In contrast, the results obtained for the postwar period are altogether more plausible.

The estimated total expenditure elasticities for fuel and light show a similar discrepancy. There is a significant difference between the two periods and also between the two estimates, from time series and budgets, for the interwar period. The postwar results are undoubtedly influenced

[1] Cochran, W. G., "The Combination of Estimates from Different Experiments," *Biometrics*, Vol. 10, No. 1, March 1954, pp. 101–29.

by the restrictions on domestic coal consumption. It is also possible that the budget figure reflects the use of more efficient apparatus at higher income levels.

The three values of $b$ obtained for entertainments are open to conflicting interpretations. While they are found to be significantly different if all three are taken together, on the same statistical tests it would be permissible to combine either the two time series values, 0·33 and 0·78, or the two interwar values, 0·78 and 1·82. This series is largely dominated by cinema receipts, and the more reasonable hypothesis is, perhaps, that with changes in tastes and social habits there has been a shift in the value of this parameter between the two periods. In this case the combined value for the interwar period alone would be $1{\cdot}80 \pm 0{\cdot}13$, and there is a clearly marked change to the relatively inelastic postwar value, $0{\cdot}33 \pm 0{\cdot}30$.

It is doubtful whether the significant differences between the price (substitution) elasticities in the two periods for other alcoholic drink, and also for furniture, indicate a similar shift in consumer reactions. Although not significantly different from zero, the large positive coefficient for alcoholic drink obtained in the postwar period points to the presence of some unidentified disturbing factor closely correlated with the price movements. For furniture, some part of the difference may reflect the changed composition of the group. A converse movement is observable in the values for hardware.

An interesting feature of the results for durable household goods is the higher value of the adjustment parameter obtained for the postwar period, $r = 0{\cdot}30 \pm 0{\cdot}15$, compared with $0{\cdot}15 \pm 0{\cdot}07$ for the interwar period. Since the standard error is relatively large for the postwar figure, the two values are not significantly different, but the increase is nevertheless quite marked. This increase for the group as a whole can be seen to be mainly associated with furniture and furnishings; for the other sub-group, hardware, the value of $r$ is slightly lower for the postwar period. It is tempting to relate this change to the greater prevalence of hire-purchase schemes in the postwar period. When expensive durable goods can be acquired by an initial payment which is only a proportion of the total cost, clearly the speed of adjustment to a new equilibrium position is likely to be more rapid. A much more precise analysis would be needed to confirm this conjecture. In particular, it would be desirable to relate changes in the adjustment parameter within the postwar period to the varying hire-purchase requirements that have been imposed at different times.

The combined values, which have been obtained in the majority of cases, represent the most precise estimates of the structural demand parameters that can be made from the data available. They are not necessarily the best for all purposes. If it were desired to make short-term forecasts of demand, for instance, it would not be advisable to recalculate the coefficients of Table I on the basis of these combined values. The first criterion of a fore-

casting equation is goodness of fit, and for this purpose it may not be necessary to uncover the fundamental structure. If the temporary distortions and interrelations with extraneous factors are likely to persist into the immediate future, the regression coefficients based on the most recent experience form the best basis for extrapolation. Only as the range of the forecast is extended into the future does it become increasingly desirable to distinguish the underlying structure from the temporary disturbances.

For long-term forecasts it might be sufficient to establish simply the future equilibrium position of consumption, which depends only on the long-period elasticities and the future levels of income and prices. It is one implication of the dynamic formulation of the demand equation, however, that to determine the actual level of demand in the future it is necessary to specify also the intermediate course of income and prices.

## V. Conclusions

The results obtained in this paper may be briefly summarised in the following conclusions.

(1) A simple dynamic formulation of consumers' behaviour has been put forward which relates to both durable and perishable goods. Its principal features are a distinction between purchases and consumption of durables, and variable rates of adjustment to equilibrium levels of consumption for all commodities. The theory has been applied to the quarterly series of consumers' expenditure for the period 1950–56. Ten principal groups and subgroups of expenditure are covered, and the results are set out in Table I. The degree of explanation obtained is generally high, and the coefficients are mostly plausible.

(2) A few special features of these results may be noted. A short lag in the effective level of total expenditure appears to be characteristic of durables. Exogenous weather factors are observed to have an important influence on the demand for a number of perishable commodities. The relative importance of both these effects, however, decreases as the length of the unit time period is extended. Support for the dynamic hypothesis is found in the plausible pattern of behaviour which emerges from the observed adjustment rates.

(3) Comparisons with results for the interwar period suggest that for many commodity groups an important part of the demand structure remains relatively stable over time; relative, that is, to the accuracy with which this part of the structure can be determined with the observations available. As is shown in Table II, significant differences were found in only eight of the thirty comparisons made for the three structural parameters considered.

(4) A consequence of this underlying stability is that data from both periods may be combined to provide estimates of the parameters. The

results of family budget inquiries may also be combined with those of th time series analysis to estimate the long-period total expenditure elasticities The combined values obtained in this way are also shown in Table II.

(5) Taken alone, the data for the short postwar period of only seve years often yield estimates of the structural parameters which are subje to wide margins of error. Nevertheless, the observed regression equation are likely to provide the best basis for short-term forecasts.

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# BANK CREDIT AND GOLD IN THE UNITED KINGDOM

THE Radcliffe Committee has been appointed to inquire into "the working of the monetary and credit system," and it could be described as a new version of the Macmillan Committee which reported in 1931. A survey of the credit position at the end of 1956 might usefully be compared with that at the end of 1930 and with certain intermediate dates.

It would be helpful to examine definitions of "money" and "credit." Continental writers [1] have for a long time complained that English writers have confused the terms "money" and "credit." Since Keynes wrote in 1936 English writers have come to include in a definition of "money" certain types of bank credit. For example, the definition of "money supply" used by the International Monetary Fund consists of bank-notes and demand deposits owned by the public. It is strange that the items covered by the definition of "money supply" should not appear on the same side of Bank Balance Sheets as Gold, which has historically been known as "money." [2] Writers such as Keynes seemed uncertain what exactly to regard as money, and somewhat uncertainly he suggested that the line could be drawn to include bank credit with a tenor of less than three months, three days, three hours, etc.,[3] while other writers talk about "near money." To avoid confusion the present notes will refer to Bank Credit as consisting of liabilities owed by the banks to the public whatever the tenor of such debts. It is recognised that in the United Kingdom (and indeed generally in the Sterling Area) individuals are not allowed to use the commodity money, gold, for what was the normal purpose of settling debts, and the process of debt settlement now proceeds through the transfer of bank liabilities (usually those due at sight) from one individual to another. At the same time the International Monetary Fund arrangements envisage a par value in gold for the national currencies of its members, and in terms of its rules gold can be used as a solvent of international debts at the prescribed rates. Given the prohibition on the internal circulation of gold,

[1] See, for example, the remarks by Charles Rist in his *History of Monetary and Credit Theory*.

[2] As Mr. H. V. Morton in his *A Traveller in Rome* has recently reminded English readers, the word "*moneta*," of which the modern English form is "money," was applied to Roman coins because the Roman mint was originally in the temple of Juno Moneta. It is quite clear that in the historical sense the word "money" applies to metallic material—to what modern Americans would call "rolling money" and not to what they would call "folding money."

[3] On p. 167 of his *General Theory of Employment, Interest and Money*, Keynes, in defining the rate of interest as "the inverse proportion between a sum of money and what can be obtained for parting with control over the money in exchange for a debt for a stated period of time," says that the line between money and debt can be drawn "at whatever point is most convenient for handling a particular problem." He continued that as a rule he would "assume that money is co-extensive with bank deposits," which would presumably include both current and time deposits.

bank credit is used within the United Kingdom as if it were " money," and in international transactions the Central Banks among themselves use gold in the historical manner as " money." Despite what writers in recent decades have said, gold remains the final means of settlement of international debts, and the Western World, with its problems of international payment, may be said to be on an imperfect gold standard.

By adding together the Balance Sheets of the London Clearing Banks and the Bank of England and, as it were, putting the figures through a sieve, one may obtain an overall picture of the banking system. The omission of the " outside " banks is not serious, because of the relative insignificance of their figures. It is necessary to bring in the Gold held by the United Kingdom Government, and this has been done by offsetting the amounts against Government Stock held by the Bank of England. Because the United States will when requested by Central Banks sell gold against dollars acquired in official transactions, dollars are regarded as the equivalent of gold for the purposes of these notes. Inter-bank debts, as between the Central and Commercial Banks, are cancelled out. The figures for Bank Premises are set off against Capital and Reserves to give Net Capital and Reserves.[1] With certain other somewhat arbitrary assumptions, some approximation and a little guessing, the Balance Sheets of the banking system at the end of 1930 and at the end of 1956 come out as follows:

TABLE I

*Banking System of the United Kingdom—Consolidated Balance Sheets * at end of* 1930 *and end of* 1956

(Figures in £ million)

| | 1930. | 1956. | Increase above 1930. | Percentage increase. | | 1930. | 1956. | Increase above 1930. | Percentage increase. |
|---|---|---|---|---|---|---|---|---|---|
| Net Capital and Reserves | 111 | 148 | +37 | 33% | Gold (including dollars) | 155 | 762 | +607 | 392% |
| Bank Credit in Hands of Public (including bank-notes) | 2,124 | 8,256 | +6,132 | 289% | Private Debts | 1,165 | 2,841 | +1,676 | 144% |
| | | | | | State Debts | 915 | 4,801 | +3,886 | 425% |
| | 2,235 | 8,404 | +6,169 | 276% | | 2,235 | 8,404 | +6,169 | 276% |

* See the Appendix below for the sources of the figures and the build-up of the items.

It will be seen that Bank Credit at the end of 1956 is almost four times what it was at the end of 1930, and that the main source of this increase was the increase in the debts owed by the State to the banking system, the total of

[1] Banks usually grossly undervalue their premises, and on a proper valuation both Bank Premises and Capital and Reserves should be increased by the amount of excess depreciation. The set-off as above removes the difficulty, and the figure of Net Capital and Reserves is closer to the capital employed in the banking business as distinct from that of property owners in the same way as it would be if the banks all used rented premises.

which was over five times what it was at the end of 1930.[1] The amount of Net Capital and Reserves would on a proper revaluation have to be increased by the amount of excessive depreciation employed by the Banks in the valuation of Government Stocks included in State Debts, which latter item would then have to be increased by a similar amount. In order to assess the increase in the size of the total of Bank Credit, it will be assumed that the price of Gold had not been changed and that the figure of Net Capital and Reserves had also not varied. On these assumptions the consequent adjustments would mean an increase in Bank Credit of £6,169 million, which would have been created against increases as follows:

| | £ million. |
|---|---|
| Gold | 104 |
| State Debts | 4,389 |
| Private Debts | 1,676 |

On this basis over 70% of the increase in Bank Credit arose from the increase in the State's debt to the banking system.

The items in the Balance Sheets are only approximate figures, and are not the exact balances on the accounts. As, however, all the tables representing Balance Sheets have been drawn up on a comparable basis, they should be useful indicators of trends and of orders of magnitude.

In considering these figures, some of the older generation might recall some words of Lord Bradbury in his Memorandum of Dissent to the Macmillan Committee's Report. He then, in discussing the growth of treasury bills, said:

> "We might reach a state of affairs in which the whole of the trade and industry of the country would be carried on on the basis of credit balances against which the banks would hold cash, treasury bills and securities only. High money rates would then be powerless to check expansion unless and until a point was reached at which it would be more profitable to the industrial concerns to keep their balances on deposit than to employ them in industry, or prices had risen so high that they not only had to employ the whole of them but borrow as well.
>
> "The former stituation would be an impossible one for the banks except in so far as the deposits to be immobilised did not exceed their own short-date assets—otherwise they would lose money heavily, while the latter would not arise until inflation had gone far enough to disorganise the whole financial structure."

[1] As shown in the Appendix, Bills Discounted in the Balance Sheets of the London Clearing Banks are regarded as State Debts. This treatment overstates the amount of State Debts to the extent that Bills Discounted include the bills discounted for the private sector. The error involved here would not appear to be large, for example, of the total of £1,416 million for Bills Discounted at the end of 1956 only £140 million related to bills other than Treasury Bills. The Macmillan Report gives a figure for Treasury Bills discounted at the end of 1930 as £181·8 million. No figures are unfortunately available for the intervening years, but it is clear that the magnitudes involved are not large enough to disturb the general picture presented in the Balance Sheets.

The ratio of Gold to Bank Credit at the end of 1930 was 7·3% and at the end of 1956 it was 9·2%. It is known that in order to protect its Gold—its reserve of internationally usable money—the Bank of England was in 1930 following a credit policy which led to a restriction of activity in Britain and that the Macmillan Committee did not foresee that the legal requirements regarding gold conversion could not long be maintained. The ratio of 7·3% was in the circumstances proved to be totally inadequate, and the question arises whether, at present when there exist considerable restrictions on convertibility, the ratio of something under 9% is also not totally inadequate.

The Balance Sheets above are, as it were, snapshots taken at different times of the train of events, and it is desirable to look at some additional ones taken at other points of time in order to bring out certain significant changes through the flow of time. For selected dates, the relevant figures are:

TABLE II

*Banking System of the United Kingdom—Balance Sheets at end of Years Stated*

(Figures in £ million)

| | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|
| Gold (including Dollars) | 155 | 550 | 642 | 457 | 762 |
| Private Debts * | 1,165 | 1,230 | 1,713 | 2,210 | 2,841 |
| State Debts | 915 | 971 | 4,623 | 4,822 | 4,801 |
| | 2,235 | 2,751 | 6,978 | 7,489 | 8,404 |
| Net Capital and Reserves | 111 | 112 | 126 | 131 | 148 |
| Bank Credit | 2,124 | 2,639 | 6,852 | 7,358 | 8,256 |
| | 2,235 | 2,751 | 6,978 | 7,489 | 8,404 |
| Ratio of Gold to Bank Credit | 7·3% | 20·8% | 9·4% | 6·2% | 9·2% |

* Included in this item are the following figures for Advances by the Clearing Banks in £ million:

| 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|
| 929 | 966 | 980 | 1,378 | 1,912 |

The widening difference between these figures and the total of Private Credit would appear largely to depend on extra-bank borrowing and related transactions.

In order to see more clearly the origins of the increase in Bank Credit, one may assume that the Net Capital and Reserves are employed first in holding Gold, and that the balance of Gold, State Debts and Private Debts are the sources of Bank Credit.[1] This arrangement results in the figures shown in Table III.

[1] This assumption is quite arbitrary, but is necessary in the attempt to isolate the effect of the increase in State Debts on the total of Bank Credit. Other assumptions could be used in this attempt, *e.g.*, if Net Capital and Reserves were set off against State Debts the influence of the increase in State Debts on the growth of Bank Credit would still be quite obvious.

TABLE III

*Banking System of the United Kingdom—Sources of Bank Credit at end of Years Stated*

(Figures in £ million)

| | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|
| Gold held against Net Capital and Reserves | 111 | 112 | 126 | 131 | 148 |
| Balance of Gold | 44 | 438 | 516 | 326 | 614 |
| Private Debts | 1,165 | 1,230 | 1,713 | 2,210 | 2,841 |
| State Debts | 915 | 971 | 4,623 | 4,822 | 4,801 |
| BANK CREDIT | 2,124 | 2,639 | 6,852 | 7,358 | 8,256 |
| Ratio of State Debts to Bank Credit | 43% | 37% | 68% | 66% | 58% |

In a comparison of the figures of 1930 and 1938, the latter show the greater liquidity in the international sense because of the greater gold holding, viz., in the increase of £395 million (from £155 million to £550 million), of which increase about £236 million could be ascribed to a change in price and £159 million to the change in physical quantity. The devaluation of sterling in terms of gold from September 1931 onwards meant that the transfer out of sterling into foreign currencies of given amounts expressed in pounds sterling resulted in a smaller loss of physical gold than would have been the case in 1930. As compared with 1930, the figures of unemployment were diminished, and the national net product had increased. In this process private enterprise had no doubt been assisted in increasing its activity by the increase in Private Debts (by £65 million from £1,165 million to £1,230 million). In any event 1938 was more nearly normal (with any of the three preceding years) than any of the other years after 1915.

The comparison between 1938 and 1946 shows the full force of war finance. The item Bank Credit increased by 160%, while State Debts and Private Debts showed increases of 376% and 39%, respectively. The gold price had changed from £7 8*s*. 10½*d*. to £8 12*s*. 6*d*., so that the increase in gold holdings of £92 million could be said to be made up of £88 million from an increase in value and £4 million from an increase in physical quantity. The ratio of Gold to Bank Credit had decreased from 20·8% in 1938 to 9·4%. The latter figure was somewhat above that of 7·3% in 1930, but withdrawals by foreigners or United Kingdom Nationals were now restricted, and if the same freedom of transfer existed then as did exist in 1930 the ratio would probably have been much worse.

By 1948 the ratio of Gold to Bank Credit had dropped to 6·2%, *i.e.*, well below the low figure of 7·3% in 1930. Bank Credit had increased by £506 million over the 1946 figure primarily because of an increase in Private Debts of £497 million. State Debts showed an increase over the same period of £199 million, while the figure for Gold showed a large decline of £185 million. (If the devaluation of September 1949 had occurred at this point

Gold would have been increased by £105 million over the figure shown for 1948.)

The devaluation of September 1949 increased the price of gold by approximately 45% (from 172*s.* 6*d.* to 250*s.* per ounce fine). The figure of £762 million for Gold at the end of 1956 shows an increase over 1948 of £305 million, of which £237 million could be ascribed to the writing-up of gold. In terms of liquidity (as measured by the Gold/Bank Credit ratio) this position represented a considerable decline from the improved position prevailing immediately after the devaluation of September 1949. The main reason for this was the increase in Private Debts by £631 million. State Debts showed a slight decrease of £21 million. However, with all the changes that had taken place the banking position at this time was highly illiquid in the international sense, while the trade position was such that it was not clear whether activity would show an increase or decrease.

The above analysis is by its nature a partial one, since the Consolidated Banking Balance Sheets represent only a portion of the total credit picture. While the banking system shows a slight decline in State Debts, the total of Government Debt had in fact increased from £25,168 million at the end of 1948 to £29,919 million at the end of 1956, although the figures for the Floating Debt had over the same dates been brought down from £6,355 million to £5,198 million. This mass of debt, to the extent to which it is not already held by the Banks or Government Departments and could be offered for discount to the banking system, contains a latent threat of considerable magnitude to the international liquidity of the banking system. Such discounting could be made the subject of the withdrawal of funds out of sterling, with consequent pressure on the Gold Reserves.[1] The partial picture of the credit system given above represents an enormous pledging by the State of the public credit. To preserve the security of the State, much of this was necessary, but the process has proceeded beyond this to an extent that the public use of credit might be better described as the public abuse of credit.

It is desirable to relate the partial picture above to other movements in the community's economic life, and in this more attention will be paid to the more recent dates. As the banking position in 1938 showed a more normal position than that of 1930, a clearer picture of the abnormality of the recent positions can be obtained by comparing them with the position in 1938. In order to keep the Balance Sheets simple it was desirable to work with the item of Bank Credit. The relationship between this figure and what the International Monetary Fund calls Money Supply is fairly constant, as shown in Table IV below, the differences arising mainly from the exclusion from the latter figure of Time Deposits. The Demand Deposits of the Clearing Banks appear also to form a fairly constant proportion of between two-thirds and three-quarters of Money Supply.

[1] The reader is reminded that here, as elsewhere in these notes, "Gold Reserves" cover both the physical gold and the dollars held in the reserves.

The purpose of credit is to facilitate production and/or consumption. Essentially credit is a process whereunder money or money's worth passes and the compensation required from the transferee is delayed in time. It is the delay in time of settlement that facilitates production and/or consumption, and hence the effect of credit on the generation of income and the growth of capital requires a study of the entire credit system, within and

TABLE IV

*Bank Credit and Money Supply*

(Money figures in £ million rounded off to nearest £10 million)

| Year end. | Bank Credit, £ million. | Money Supply, £ million. | Money Supply as percentage of Bank Credit. |
|---|---|---|---|
| 1938 | 2,640 | 1,640 | 62 |
| 1946 | 6,850 | 4,950 | 72 |
| 1948 | 7,360 | 5,110 | 69 |
| 1956 | 8,260 | 5,760 | 70 |

without the banking system. The ability of the banking system to control the use of its own deposits is limited. For example, if as the result of a "credit squeeze" certain would-be borrowers are refused Advances which would have led to an increase in the total of Bank Credit, the same result in relation to the generation of income would be secured if those requiring accommodation were given the use of bank deposits (via private loans) which deposits would otherwise have been kept idle by the lenders.

A complete survey of the national economy would in a national balance sheet have to take account of all credit net positions within and without the banking system. In a sense everyone who is owed and owes acts like a banker, and the amount of credit granted by credit-giving institutions which are not normally called banks is known to be large. In the flow of transactions the credit operations outside the banks inevitably have repercussions on the banking system and on the volume of the bank credit that can be made the subject of a withdrawal of gold. Similarly, the transactions outside the banks have a considerable influence on the generation of income and the stock of capital and, hence, on prices. It would, however, appear probable that on this broader basis the basic argument in these notes would be strengthened rather than weakened.

The inadequacy of the Gold in the banking system can be seen also in its relationship to the total of United Kingdom trade, as shown in Table V.

It will be seen from this that only relatively slight fluctuations in the trading figures can make considerable inroads into the Gold Reserves. On the basis of the figures at the end of 1956, changes which were the equivalent of an 11% drop in exports and of a similar rise in imports would together be more than sufficient to exhaust the whole of the Gold Reserves. Recent experience has shown how the equivalent of forward transactions can still

take place despite all kinds of restrictions by changing dates of payment (" leads " and " lags "). If imports and exports were assumed to continue at the 1956 rates, then the Gold Reserve would be exhausted by importers having paid in advance of normal due dates for six weeks' imports, and at the same date having delayed receipts beyond the usual dates of settlement for six weeks' exports.

TABLE V

*External Trade and Gold*

(Figures in £ million)

| Year. | Imports. | Exports. | Total External Trade. | Gold. | Gold as percentage of External Trade. |
|---|---|---|---|---|---|
| 1938 | 919 | 533 | 1,452 | 550 | 38 |
| 1946 | 1,301 | 966 | 2,267 | 642 | 28 |
| 1948 | 2,075 | 1,639 | 3,714 | 457 | 12 |
| 1956 | 3,889 | 3,318 | 7,207 | 762 | 11 |

The liquidity ratio can be improved by any act which reduces Private Debts or State Debts with a counterpart reduction in Bank Credit. On the figures at the end of 1956 if it were desired to re-establish a ratio of Gold to Bank Credit of, say, 20%, this would imply reducing the total of Bank Credit to £3,810 million, that is, a figure considerably in excess of the then existing total of Private Debts, namely, £2,841 million. If the desired ratio were taken as only 15%, then the total of Bank Credit should not exceed £5,080 million, a reduction of £3,176 million, which is still a reduction greater than the then existing amount of Private Debt. The determination of what is a " safe " ratio would require a detailed and laborious series of calculations and must, as explained later, take into account the time dimensions of the existing debts. On the basis of the United Kingdom's experience in this century, it does not appear that anything less than 15% could be regarded as " safe."

The pressures which can arise to drain away a gold reserve do not, however, come only from the net results of external trade transactions, but also of financial transactions. What is relevant is the size of the drain which would follow a loss of confidence. A full analysis would require the adding of time dimensions to the credit items in the banking balance sheets which above represent flat pictures. A comprehensive assessment in time would require a statement of fluctuations in the net reserve position, *i.e.*, how the gold holdings will fluctuate through time with the addition of foreign debts receivable and the subtraction of foreign debts payable as the two sets of debts run off in time. This could perhaps be termed the " run off " position, but decisions in practice will be made on the basis of the " expected " reserve position, *i.e.*, how the " run off " position will be altered by transactions expected to occur in the future. While a full analysis would

require such statements and no doubt the Radcliffe Committee will attempt such an analysis, it is the possibility of withdrawals from the large total of Bank Credit against the slim figure of Gold that causes outside observers to view the United Kingdom's Banking Balance Sheet with continuing dismay and fear for the future.

The relative scarcity of Gold in the British banking system can also be seen from other sets of figures. The figures of depreciation used as a deduction in computing the Net National Income are accounting provisions required to assess net income, but are not the subject of banking transactions. The Gross National Product is, therefore, a more suitable figure to represent the money value of current activity which (to the extent that in the process net debts are created in favour of foreigners) has reference to the possible loss of gold. The increasing scarcity of gold in this relationship can be seen from the following table:

TABLE VI

*Gold and Gross National Product*

(Figures in £ million)

| Year. | Gold. | Gross National Product. | Gold as percentage of Gross National Product. |
|---|---|---|---|
| 1938 | 550 | 5,175 | 10·6 |
| 1946 | 642 | 8,787 | 7·3 |
| 1948 | 457 | 10,368 | 4·4 |
| 1956 | 762 | 18,117 | 4·2 |

This decline has occurred despite the fact that the price of gold has increased in sterling by two-thirds since 1938.[1]

The effect of Government financing can be seen from the following table, which shows how the Gold equivalent of the National Debt has increased at different year-end dates:

TABLE VII

*National Debt in Ounces of Gold*

| Year. | National Debt, £ million. | Price of Gold, £ per oz. | Ounces of Gold equivalent to National Debt. |
|---|---|---|---|
| 1938 | 7,131 | 7·4438 | 958 million |
| 1948 | 25,168 | 8·1562 | 3,086 ,, |
| 1956 | 29,919 | 12·5 | 2,394 ,, |

[1] The relative scarcity in terms of physical gold is much greater. For example, at the end of 1938 there existed £36 of Bank Credit against every ounce of gold held, and at the end of 1956 the similar figure for Bank Credit had increased to £135. It has also to be remembered that while £762 million for Gold at the end of 1956 appears to be a suitable enhancement of the figure of £350 million at the end of 1938, the 1938 figure actually related to a greater quantity of physical gold (74 million ounces for 1938 as against 61 million ounces for 1956).

While it is not possible to construct the National Banking Balance Sheet as at September 30, 1957, an idea of how its face is likely to have changed can be obtained from the movement of some of the figures which it would embody.

A rough approximation of the Consolidated Banking Balance Sheet as at September 30, 1957, can be obtained by incorporating in it the changes in certain items between the end of 1956 and at the end of September 1957. The main changes are:

| | £ million. | |
|---|---|---|
| GOLD | −101 | (Official Figure) |
| PRIVATE DEBTS | | |
| Money at Call and Short Notice | − 75 | (London Clearing Banks) |
| Advances | + 42 | " " " |
| Discounts and Advances | − 4 | (Bank of England) " |
| | − 37 | |
| STATE DEBTS | | |
| Investments | + 39 | (London Clearing Banks) |
| Bills Discounted | −102 | " " " |
| Government Securities | + 91 | (Bank of England) " |
| Other Securities | + 2 | " " |
| | + 30 | |
| *Less* | | |
| Public Deposits | − 2 | " " |
| | + 32 | |

The approximate Balance Sheet, with no adjustment to the Capital Accounts and with Bank Credit as the residual item, would be as follows:

BANKING SYSTEM OF THE UNITED KINGDOM

*Approximate Balance Sheet at September* 30, 1957

(Figures in £ million.)

| | | | |
|---|---|---|---|
| Net Capital and Reserves | 148 | Gold (762 − 101) | 661 |
| | | Private Debts (2841 − 37) | 2,804 |
| Bank Credit | 8,150 | State Debts (4801 + 32) | 4,833 |
| | 8,298 | | 8,298 |

Ratio of Gold to Bank Credit: 8·1%

With Bank Credit still at a figure in excess of £8,000 million and Gold below £800 million the system is still highly illiquid, and the transactions which took place over the first nine months of 1957 have in their total effect led to a weaker net reserve position. It is true that some of the funds withdrawn may come back if disappointed overseas speculators come to replenish sterling working balances on which they drew and if British and/or other operators of the " leads and lags " techniques reverse their procedure. It is, however, also clear that the relationship between Gold and Bank Credit is such that a critical point could quite easily be reached beyond

which point residents of the sterling area as well as non-residents may decide to "get out of sterling." It might in such circumstances be that a further devaluation would not be either right or wrong, but simply inevitable.

Some South African economists (including the writer) have for a long time been advocating that the only answer to this problem of international illiquidity for the United Kingdom and many other countries is a general increase in the price of gold, which is something quite different from a separate unilateral devaluation which means an exchange depreciation. Under the general devaluation exchange rates *ipso facto* would remain unchanged despite the change in the price of gold expressed in the different national currencies, although as a separate act some realignment of rates might at the same or later date be desirable.

Despite what the critics who dislike gold have written in this century, the national treasuries still scramble for gold or currencies backed by substantial gold reserves. Where, however, the majority of them are illiquid and, therefore, "gold hungry," the attempt by one or some to replenish their gold reserves would simply put further pressure on their already illiquid neighbours. In this connection if one compares the rise in the gold reserves of Western Germany with the declines in the reserves of neighbours such as the United Kingdom, France, Holland and Belgium, one obtains the impression that the growth of Western Germany's reserves has occurred simply by drawing gold away from the others. Within the system of the imperfect gold bullion standards now existing any current redistribution of gold leaves untouched the basic problem of the overall illiquidity of the system. For Paul to increase his holding of money, Peter's holding has to fall. It is clear to anyone who examines the figures that, given general illiquidity, the cure cannot come by mere transfers as between the countries included in the system. (One of Britain's problems is that of obtaining a relationship between its Bank Credit and its Gold such that it will be liquid enough to withstand periodic attacks on its till.)

On the statistical evidence given above the British Gold Reserves are inadequate for the needs of Britain as an international banker. All that has been said here supports the many statements by the United Kingdom authorities on the gravity of the problem. It is not, however, contended that Britain's position has suddenly and seriously deteriorated in relation to neighbours, who are in a stronger position of international liquidity, and that a further unilateral devaluation of sterling must follow. If one accepts that it is important that Britain retains its position as international banker, then it follows that she must act responsibly. If Britain simply sought to build up her own reserves by policies designed to draw gold from the reserves of other Western countries the overall illiquidity would not be removed—the pressures would simply be redistributed. For the moment the individual members of the system can find some protection in the fact that their fellow members also have weak positions. Any attempt, therefore,

to introduce what used in the thirties to be called " beggar-my-neighbour policies " will simply cause the damage, known to be great, arising from competitive exchange depreciations. If Britain is to keep leadership in the field, the United Kingdom authorities cannot selfishly seek remedies to improve temporarily Britain's position at the expense of her neighbours and friends. On the other hand, to retain her leadership Britain should lead the endeavour to obtain through international agreement and action overall relief by a general enhancement of liquidity.

These notes have not been concerned with the mechanics of credit management. Open-market operations and similar methods can, however, easily be related, *e.g.*, purchases or sales of Government Securities initiated by the Central Bank would by changing the Clearing Banks' balances with the Central Bank affect the Consolidated Balance Sheet through the changes induced in Private Debts and/or State Debts and, hence, Bank Credit would be affected.

In dealing with the problem recent policy has been directed to improving the liquidity of the system by the contraction of Bank Credit. The British authorities at the same time are politically committed to maintaining a high level of employment and activity. The policy of protecting the reserves through credit contraction may, therefore, easily lead (as happened in the 1930s) to a recession with considerable unemployment. On the other hand, the reserves are so slender that any further drop might mean that the critical point would soon be reached. It would appear, therefore, that the authorities are faced with a dilemma, and the problem would appear to be such that it cannot be solved by national action alone but requires international co-operation.

It can, of course, be argued that there are the " second line " reserves and that even if gold reserves fell to almost nothing, this fall would matter little. The latter contention ignores the danger of going beyond the critical point, while the former ignores Britain's special position as an international banker. The " secondary reserves " do not become liquid reserves simply because the word " reserves " is applied to them—certainly they do not represent the reserves which Britain's foreign banking customers would choose to regard as making sterling safe. Furthermore, if things were to slide beyond the critical point it is doubtful even if they would be sufficient.

The proposition of a general rise in the price of gold now has many supporters in the City of London, and is also supported by a number of reputable academic economists. In its examination of the problem it would also be very desirable for the Radcliffe Committee to pay much attention to it. Britain and the Commonwealth have a large stake in the matter for various reasons, the most important of which are:

(i) A substantial increase in the price of gold would so improve the liquidity of the United Kingdom's banking position that it could, with-

out danger to its position as banker, pursue the credit policies appropriate to maintaining a high level of employment while avoiding inflation. The same consideration applies to all the other illiquid currencies, but is proportionately more important to the United Kingdom because of sterling's role as the premier currency used in world trade. The peoples of the Commonwealth as a whole have an interest in wishing that sterling should be strong and that Britain's position as international banker should be maintained.

(ii) The weight of the external debt would be greatly reduced when expressed in terms of gold. Britain's debt to the Colonial Empire alone is greater than her Gold Reserve at its present currency value. If an all-round change in the price of gold were made, Britain's creditors would not be prejudiced in terms of the purchasing power of the payments, but the drain on the Gold Reserves occasioned by debt payments would be greatly reduced.

(iii) On the figures for 1956 the Commonwealth produces something like seven-tenths of current world production (about 23 million ounces worth £288 million sterling).

(iv) The United Kingdom's holdings of gold-mining shares are substantial. On a rough estimate the market value of its holdings in South African gold-mining companies alone (valued at the present depressed prices) appears to be in the order of £230 million. According to Bank of England figures the United Kingdom's dividends from gold mining in 1956 were in excess of £8½ million. Britain's gain from a substantial rise in the price of gold would be significant both in relation to its capital assets and its overseas income.

In brief, a rise in the price of gold would perhaps do more than any other conceivable act to restore on a sound basis Britain's position as international banker.

The writer believes that much nonsense has been talked in recent years about the historical workings of the Gold Standard, in particular about so-called "rules of the game." Unfortunately those who operated the system did not write text-books regarding their operations and largely ignored the writings of critics who had imperfect and distorted ideas regarding their operations. Unfortunately, the ideas of the critics have survived as a kind of folklore—a myth in which the Gold Standard is a monster living on the miseries of the unemployed. The Gold Standard was never a thing defined. For a relatively short time in history a substantial number of civilised countries had currencies which could be converted into gold, internally and externally, and these countries could be said to represent a system of gold currencies to which the loose term of International Gold Standard could be applied. The monetary authorities within the countries did, in framing their credit policies, take into account the international

repercussions of their actions, but as they themselves vigorously asserted, they did not follow automatic rules. Their actions regarding credit policy did, in fact, have to take account of many factors, and involved much judgment. They were concerned also with internal political influences, and in the thirties they were anxious to secure greater international co-operation. None of this adds up to action in terms of set " rules of the game." At the time the Macmillan Committee was sitting the attempt to provide greater liquidity through control of bank credit did lead to unemployment, but neither the Macmillan Committee nor the then Governor of the Bank of England appeared to realise that the least harmful way to restore liquidity was to change the price of gold through international action.[1] To-day the Western World can still be said to be on a kind of Gold Standard, and it would surely be desirable to deal with its present deficiencies. To-day, as in the thirties, the choice is confined to:

(i) A series of successive separate devaluations with all the disturbances of competitive exchange depreciation until all-round liquidity of the system is restored, or

(ii) An all-round increase in the price of gold by international agreement.

If the price of gold were increased there would still be need for international co-operation [2] and the United Kingdom would still have many problems to contend with, including problems of wages, productivity, etc., but many of these would largely disappear if credit policy sought to avoid both inflation and deflation. In the course of history more than one empire has suffered a severe decrease in its commodity money reserve, and the attempt to rebuild its treasure could not be secured by simple single measures —many hard tasks had to be undertaken.

To-day when some appear to believe that the sterling problem is simple and requires nothing more than flexibility of interest rates and floating exchange rates, perhaps others will remember some words used by Lord Bradbury in his Memorandum of Dissent to the Report of the Macmillan Committee. In dealing with how investors could and would be hoodwinked by credit manipulations, he said:

" If currency ' management ' is to be used to facilitate manœuvres of this type, the sooner we return to an ' automatic ' system the better.

[1] Sir Henry Clay's autobiography of Lord Norman has thrown new light on the discussions held on the subject at that time. As Sir Theodore Gregory has, however, pointed out in an article in *Lloyds Bank Review* for October 1957, the discussion at that time, by confusing the effects of a particular parity and choosing to return to gold, has ever since gravely prejudiced monetary debate in the United Kingdom.

[2] For details see the writer's Presidential Address to the Economic Society of South Africa, entitled " The Need for Currency Stabilization," published in *The South African Journal of Economics* for September 1956.

Honesty, even if stupid, is a better foundation for credit than the most adroit finesse."

The writer would submit that a higher price of gold through international action by writing down bank money in terms of gold is the honest, albeit drastic, remedy which history has shown to be the proper answer to the problem of international banking illiquidity.

W. J. BUSSCHAU

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## APPENDIX

### *The Content of Items in Tables I, II and III*

SCHEDULE I

NET CAPITAL AND RESERVES

(Figures in £ million)

| | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|
| Proprietors' Capital } Bank of England | 14·5 | 14·5 | 14·5 | 14·5 | 14·5 |
| Rest } | 3·5 | 3·5 | 3·9 | 3·9 | 3·9 |
| *Plus* | | | | | |
| Capital Paid-up } London Clearing Banks | 74·3 | 78·2 | 78·2 | 78·2 | 90·5 |
| Reserve Fund } | 60·8 | 60·5 | 69·6 | 74·5 | 94·4 |
| | 153·1 | 156·7 | 166·2 | 171·1 | 203·3 |
| *Less* | | | | | |
| Bank Premises Account minus Reduction of Bank Premises Account * } London Clearing Banks | 41·7 | 44·6 | 40·5 | 40·3 | 55·5 |
| | 111·4 | 112·1 | 125·7 | 130·8 | 147·8 |

* £0·2 million in 1930 and £0·3 million in 1938.

SCHEDULE II

BANK CREDIT IN HANDS OF PUBLIC

(Figures in £ million)

| | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|
| Bankers' Deposits } Bank of England | 65·0 | 106·2 | 254·7 | 304·6 | 228·0 |
| Other ,, } | 35·5 | 36·2 | 55·1 | 103·5 | 73·3 |
| Notes in Circulation } | 358·3 | 485·6 | 1357·8 | 1253·7 | 1875·1 |
| *Plus* | | | | | |
| Current Accounts } | | | | | |
| Deposit ,, } London Clearing Banks | 1875·8 | 2253·8 | 5685·4 | 6199·5 | 6655·8 |
| Other ,, } | | | | | |
| Notes in Circulation } | 1·3 | 1·4 | 1·1 | 1·0 | 0·6 |
| | 2335·9 | 2883·2 | 7354·1 | 7862·3 | 8832·8 |
| *Less* | | | | | |
| Silver Coin—Bank of England | 4·5 | 0·2 | 2·2 | 2·3 | 5·0 |
| Coin, Bank and Currency Notes and Balances with Bank of England (London Clearing Banks) | 207·5 | 243·4 | 499·4 | 501·4 | 571·4 |
| | 2123·9 | 2639·6 | 6852·5 | 7358·6 | 8256·4 |

SCHEDULE III

## PRIVATE DEBTS

(Figures in £ million)

| | | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|---|
| Balances with and cheques in course of collection on other banks in the United Kingdom | London Clearing Banks | 54·0 | 65·9 | 246·7 | 286·5 | 350·9 |
| Items in Transit | | 3·8 | 5·0 | 14·2 | 18·0 | 15·6 |
| Money at call and short notice | | 144·0 | 159·5 | 431·8 | 485·0 | 504·6 |
| | | 201·8 | 230·4 | 692·7 | 789·5 | 871·1 |
| *Plus* | | | | | | |
| Advances to Customers and Other Accounts | London Clearing Banks | 928·7 | 966·2 | 980·2 | 1377·9 | 1912·5 |
| Investments in Affiliated Banks | | 26·3 | 24·0 | 24·6 | 27·7 | 34·9 |
| | | 1156·8 | 1220·6 | 1697·5 | 2195·1 | 2818·5 |
| *Plus* | | | | | | |
| Discounts and Advances—Bank of England | | 8·5 | 9·6 | 15·6 | 15·0 | 22·7 |
| | | 1165·3 | 1230·2 | 1713·1 | 2210·1 | 2841·2 |

SCHEDULE IV

## STATE DEBTS

(Figures in £ million)

| | | 1930. | 1938. | 1946. | 1948. | 1956. |
|---|---|---|---|---|---|---|
| Government Securities | Bank of England | 293·3 | 305·9 | 1662·3 | 1652·5 | 2165·1 |
| Other Securities | | 30·2 | 22·1 | 18·3 | 24·2 | 17·7 |
| | | 323·5 | 328·0 | 1680·6 | 1676·7 | 2182·8 |
| *Less* | | | | | | |
| Gold held by Exchange Equalisation Fund | | — | 223·8 | 642·0 | 457·0 | 762·0 |
| | | 323·5 | 104·2 | 1038·6 | 1219·7 | 1420·8 |
| *Less* | | | | | | |
| Public Deposits—Bank of England | | 14·8 | 18·2 | 12·6 | 14·0 | 16·1 |
| | | 308·7 | 86·0 | 1026·0 | 1205·7 | 1404·7 |
| *Plus* | | | | | | |
| Investments—London Clearing Banks | | 284·7 | 635·0 | 1427·0 | 1478·2 | 1980·4 |
| | | 593·4 | 721·0 | 2453·0 | 2683·9 | 3385·1 |
| *Plus* | | | | | | |
| Treasury Deposit Receipts | London Clearing Banks | — | — | 1559·5 | 1397·0 | — |
| Bills Discounted: | | | | | | |
| Treasury Bills | | 321·5 | 250·3 | 610·4 | 741·2 | 1275·4 |
| Other Bills | | | | | | 140·1 |
| | | 914·9 | 971·3 | 4622·9 | 4822·1 | 4800·6 |

## Source of Information

London Clearing Banks—*Bankers' Magazine* for February 1931, February 1939, March 1947, March 1949, February 1957 and October 1957.

Bank of England—Macmillan Report

Statistical Summary of the Bank of England for January 1939.

Bank of England Balance Sheets at February 28, 1947, February 28, 1949 and February 28, 1957.

Monthly Digest of Statistics for December 1948, December 1953 and April 1957.

Bank of England Weekly Returns for September 1957.

# RATE OF CHANGE APPROACHES TO FORECASTING —DIFFUSION INDEXES AND FIRST DIFFERENCES[1]

A DIFFUSION index for any time period and for any group of time series is simply the number of series in the group that are rising in that time period expressed as a percentage of the total number of series in the group. An *historical* diffusion index is one in which a series is classed as rising or falling by reference to its own peaks and troughs, identified well after the event. Consequently, even though a series is rising from month to month over a certain period, it may still be classed as falling if the period is part of a downswing as identified subsequently.

Historical diffusion indexes have been shown by Geoffrey Moore[2] consistently to lead the turning points of the general business cycle, typically by eight months or so in the case of peaks, 1919–37. This lead holds in the post-war period also.

The object of the present inquiry is to find whether a similar *current* measure can be constructed which also displays a long and unambiguous lead over business-cycle turning points. To this end we may ask which of the operations involved in the construction of a diffusion index are critically important for the forecasting value of a diffusion index, and which are irrelevant. Can the important ones successfully be performed currently, that is, with a lag that is small relative to the lead time of the diffusion index over business-cycle turns?

A diffusion index is constructed by the following operations:

1. A *smoothing* operation, either on the individual series or on the final index, to iron out fluctuations which are not cyclical in the business-cycle sense.
2. A *differencing* operation on the individual series.

[1] The statistical work underlying this paper was supported by the Sloan Research Fund of the School of Industrial Management at M.I.T.

[2] *Statistical Indicators of Cyclical Revivals and Recessions* (Occasional Paper 31), National Bureau of Economic Research, 1950, henceforth referred to as *S.I.*; " Analyzing Business Cycles," *American Statistician*, April–May 1954, " The Diffusion of Business Cycles," *Economics and the Public Interest*, R. A. Solo, ed. (Rutgers University Press, 1955); *Twenty-sixth, Thirtieth, Thirty-third,* and *Thirty-seventh Annual Reports of the National Bureau of Economic Research*; Thor Hultgren, *Cyclical Diversities in the Fortunes of Industrial Corporations* (Occasional Paper 32), National Bureau of Economic Research, 1950; Milton Lipton, National Industrial Conference Board, *Business Record*, June 1954, pp. 227–33, and June 1955, pp. 212–17; and NICB Technical Paper No. 5, *Cyclical Diffusion: A New Tool for Business Analysis*, 1956. For more critical approaches see Arthur L. Broida, " Diffusion Indexes," *American Statistician*, June 1955, pp. 7–16, and reply by Moore, *American Statistician*, October 1955, pp. 13–18, and John E. Maher, " Forecasting Industrial Production," *Journal of Political Economy*, LXV, No. 2, April 1957, pp. 158–65. Broida anticipated many of the negative findings of this paper, and Maher's findings with respect to the leading-series approach closely parallel those of this paper with respect to the diffusion-index approach.

3. A *transformation* of the differences to a two-valued system of attributes: rising and falling.

4. An *equally weighted count* of the number of series rising, expressed as a percentage of the total number of series in the group.

A test of the predictive power of a current diffusion index based on fifteen to twenty-six of the components of the Federal Reserve Board Index of Industrial Production, as compared with the first differences of the F.R.B. Index itself, leads to the following conclusions:

1. The *smoothing* operation is necessary, but it may be performed currently with a loss in lead time that is small compared to the length of lead time involved. A currently smoothed diffusion index of the F.R.B. Index components led business-cycle peaks, in the inter-war and post-war period, by six to twelve months.

2. The *differencing* operation is also fundamental, but it may be performed currently on an aggregate, such as the F.R.B. Index, about as effectively as on the components.

3. The *transformation* of the quantitative differences to a two-valued system of attributes, rising and falling, is not essential to the lead over turning points. The first difference of the F.R.B. Index, which preserves quantitative relations, leads turning points just about as well as does the corresponding current diffusion index. A diffusion index based on a large number of series may be somewhat smoother than the first difference of the corresponding aggregate, however.

4. Nor is the *weighting* operation fundamental, since the equally weighted diffusion index and the unequally weighted first difference of the F.R.B. Index behave similarly with respect to their leads over business-cycle turning points.

5. While the use of *hindsight* is not fundamental to the lead over business-cycle turns, hindsight *is* of fundamental importance in avoiding false forecasts, or more accurately, in distinguishing forecasts of minor fluctuations from those of fluctuations large enough to be called business cycles.

In short, a currently smoothed first difference of the F.R.B. Index has about the same predictive value as a currently smoothed diffusion index based on the components of the F.R.B. Index. Both lead all recognised business-cycle peaks in the F.R.B. Index (1919–37 and 1947–56) by six to twelve months, but both also reflect numerous minor intermediate fluctuations with a lead close to zero. The signals for a minor fluctuation do not seem to be contemporaneously distinguishable from those for a "real" business-cycle turning point.

A current rate of change measure, either first difference or diffusion, does, nevertheless, have a genuine predictive value, even though it falls far short of an historical diffusion index. First, it has the negative predictive

value that unless a slow down of the rate of growth has taken place, no business-cycle downturn is to be expected. Second, there appears to be sufficient stability in the sign, the level and possibly in the direction of movement of the smoothed rate of change to make it a useful short-term predictor of itself, and hence of the short-term future movements of the smoothed aggregate index. There is hope, therefore, of predicting, from the trend of first differences or of diffusion measures, the ups and downs of a smooth curve through the F.R.B. Index, but not of distinguishing, at the outset of a change of direction, whether it is a major or minor swing.

Whatever its limitations in forecasting what is going to happen, a diffusion index, particularly when cumulated, does furnish a valuable measure of what *is* happening. Because a current cumulated diffusion index can probably be made available some weeks earlier than the corresponding weighted aggregate index, and because it appears to be slightly smoother and to have substantially better defined turning points, it may be found to be a most valuable tool for the interpretation of current developments, possibly superior even to the F.R.B. Index.

## The National Bureau Approach to Forecasting

In *Statistical Indicators of Cyclical Revivals and Recessions* Moore explored two approaches to business-cycle forecasting arising out of the work of the National Bureau of Economic Research. One, the leading series approach, an extension of the work of Burns and Mitchell,[1] consists of a search for series which characteristically lead turning points of the business cycle, as clouds precede a storm.[2] A second approach, similar in spirit to a forecasting technique developed by C. Ashley Wright,[3] depends on the assumption, not that a particular series or set of series will characteristically lead business-cycle turning points, but that some series will always lead. That is, the leading series, or Burns and Mitchell, approach always looks to the same series to lead; the diffusion index, or Ashley Wright approach, depends on the empirical observation that all series do not turn simultaneously at a cyclical turning point, but there is a gradual build-up of the number of series that have turned as a turning point is approached, a build-up that reaches a peak at the turning point itself. It may accordingly be possible to predict the imminence of a turning point, and its timing as well, by a projection of the rate of build-up of a cluster of turning points in individual series in the early stage of the build-up.

Wright actually fitted the tail of a normal curve to the build-up in its early stages and predicted the turning point as the central point of the

[1] Wesley C. Mitchell and Arthur F. Burns, *Statistical Indicators of Cyclical Revivals* (Bulletin 69), National Bureau of Economic Research, 1938.

[2] For a constructively critical contribution to the leading series approach, see Maher, *op. cit.*

[3] "Business Cycle Research and Business Policy," *Conference on Business Cycles*, National Bureau of Economic Research (New York, 1951), pp. 339–74.

curve so fitted. Moore's approach is to construct a diffusion index, a measure of the percentage of a specified group of economic series that is rising at any time. A broadly based diffusion index will characteristically reach a peak well before the peak of the business cycle, and will cross the 50% line in the neighbourhood of a business-cycle turning point.

One such diffusion index (based on 404 economic time series with "acceptable conformity") was found to lead peaks and troughs of the general business cycle, in different periods, on the average by eight to thirteen months, and others behaved similarly.[1] This historical diffusion index led every business cycle by a substantial lead time, it skipped none, and it indicated no turning points (except 1933–35) that did not occur. "Hence the intriguing possibility presents itself that we may be able to recognize the clusters [of turning points] well before the peak or trough in aggregate economic activity." [2]

## Current Smoothing

One major hurdle must be leaped over, or cleared away, before this technique can be used for forecasting, however. The diffusion indexes which give such early and unambiguous forecasts of business-cycle turning points are *historical* diffusion indexes. A component series is counted as rising in any month, irrespective of whether it is moving up or down in that month, so long as it follows a trough and precedes a peak, as determined many months, or even years, later. It is very hard, currently, to say whether a series is rising or falling in this historical sense. That is itself a forecast.

Of course, a diffusion index can be constructed on the basis of current month-to-month movements. Such an index is shown as the thin line fluctuating around curve *B* in the chart. It is based on fifteen to twenty-six components of the Federal Reserve Board Index of Industrial Production.[3] It clearly does not exhibit the one-to-one relation of its own turning points with those of business cycles that is characteristic of Moore's historical diffusion indexes. The use of the historical definition of rising or falling involves, obviously, an heroic act of smoothing.

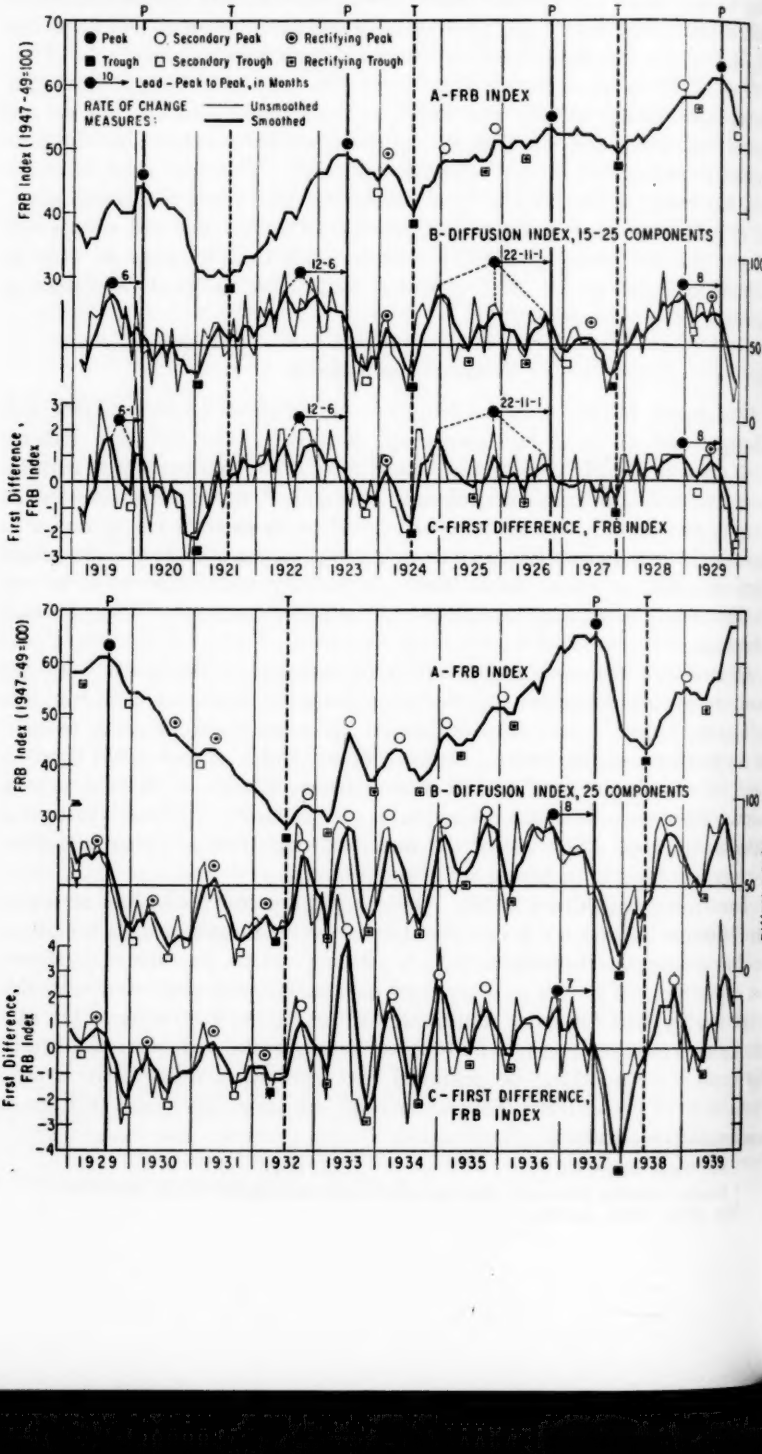
Smoothing introduces a lag. Thus, if either the individual series or the diffusion index itself is smoothed by a twelve-month equally weighted moving average, a five-and-a-half-month lag will be introduced. Moore has experimented in this manner, and his conclusion is that even with this reduction in lead time the results are still useful in forecasting. He also uses shorter moving averages and tries to interpret the rather erratic results. But cannot a smoothing be achieved that gets rid of most of the erratic fluctuation in the current month-to-month diffusion index and still leaves a substantial lead time?

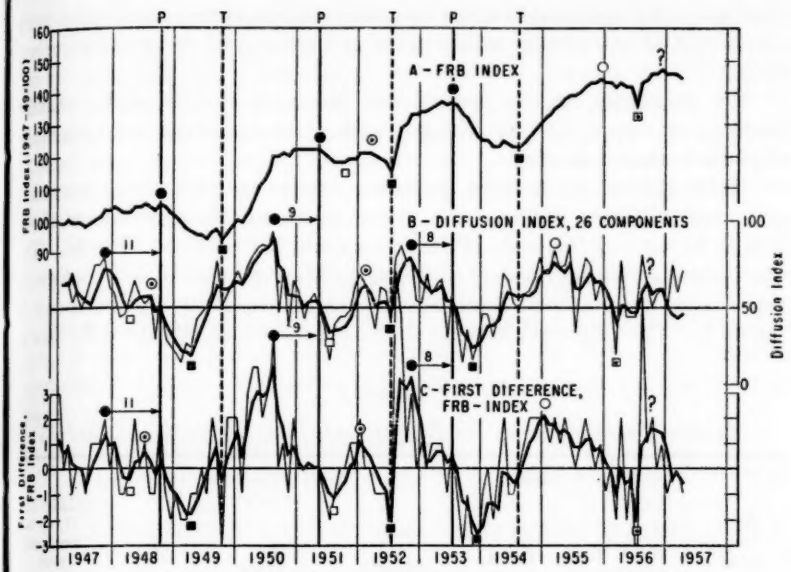
[1] *S.I.*, Table 10, pp. 46–7. [2] *S.I.*, p. 45.

[3] Kindly furnished by Moore, whose splendid co-operation should not go unmentioned.

**FRB INDEX OF INDUSTRIAL PRODUCTION AND ASSOCIATED RATE OF CHANGE MEASURES**

( Solid vertical lines indicate peaks, broken vertical lines, troughs, of FRB index )






The answer seems to be yes. Curve *B* in the chart shows a currently smoothed version of the diffusion index based on fifteen to twenty-six components of the F.R.B. Index, plotted contemporaneously.[1] That is, the smoothed value plotted for June 1935 is the value that can be computed the day that the F.R.B. Index for June 1935 becomes available. From an historical point of view it would be more appropriate to center this smoothed curve one month earlier, but that is not done in the present forecasting context because it is not actually available one month earlier. The turning points of the smoothed curve may accordingly lag about a month or so behind the turning-point dates of the unsmoothed series that can be identified by hindsight. Of course, if greater smoothness is required a longer lag must be accepted.

The currently smoothed diffusion index has quite definite peaks and troughs, although there are frequent one- and two-month interruptions of the main fluctuations. A little more smoothing, certainly introducing no more than another month's lag, would eliminate most of these interruptions.

[1] The smoothing formula used was: $14Y_t = 5x_t + 4x_{t-1} + 3x_{t-2} + 2x_{t-3} + x_{t-4} - x_{t-6}$, where $Y_t$ is the smoothed value and $x_t$ the original observation. This corresponds to fitting a second-degree polynomial to each set of seven successive observations and reading off the value corresponding to the next to the last observation. The value corresponding to the last observation was not chosen because it would involve greater computational complexity. This general type of smoothing was chosen because, based on a second-degree parabola, it would preserve curvilinearity that an equally weighted moving average would iron out. Secondly, the steadily declining weights give this smoothing formula the advantage of a substantially shorter lag at the turning points than that of an equally weighted moving average of comparable smoothing power.

And the peaks and troughs of the smoothed contemporaneous diffusion index certainly lead the corresponding peaks and troughs of the general business cycle.

For simplicity, let us confine our attention to the peaks. Similar findings also apply to the troughs, with some qualifications, principally that the leads are shorter.

Table I shows the leads of the relevant peaks of this contemporaneously smoothed diffusion index of the fifteen to twenty-six components of the F.R.B. Index over the peaks of the Index itself, 1919–39 and 1947–56. The corresponding leads of Moore's historical diffusion index of 403 conforming series over the National Bureau's turning points, 1919–37, are shown in Table I. The difference in peak dates reflects principally the difference in

TABLE I

*Leads of Predicting Series over Business-cycle Peaks 1919–39 and 1947–55*

| Year of peak. | Predicted series peak. | | Lead of Predictor (months) | | | Drop in (2) up to predicted peak. (points) |
|---|---|---|---|---|---|---|
| | N.B.E.R. reference cycle. | F.R.B. Index. | (1) Moore's diffusion index.[a] | (2) Current diffusion index,[b] | (3) First difference.[c] | |
| 1920 | January | February | 6 | 6 | 6–1[d] | 24 |
| 1923 | May | June | 9 | 6–12[d] | 6–12[d] | 16–19[d] |
| 1926 | October | October | 21 | 22–11–1[d] | 22–11–1[d] | 17–6–3[d] |
| 1929 | June | August | 8 | 8[f] | 8[f] | 11 |
| 1937 | May | July | 8 | 8 | 7 | 29 |
| 1948 | November | October | | 11[f] | 11[f] | 24 |
| 1951[e] | — | May | | 9 | 9 | 37 |
| 1953 | July | July | | 8 | 8 | 25 |

[a] 404 series with acceptable conformity; *S.I.*, Table 10, pp. 46–7.

[b] 1919–22, 15 components F.R.B. Index; 1923–40, 25 components; 1947–56, 26 components; smoothed by formula of footnote 1, p. 293. Curve B on chart.

[c] First difference of F.R.B. Index, smoothed by formula of footnote 1, p. 293. Curve C.

[d] Multiple peaks in predicting series.

[e] Possibly should not be considered a " real " business-cycle peak, cf. footnote 2 p. 299.

[f] This prediction impaired by a false trough in the predictor before the predicted series actually peaked.

timing of the F.R.B. Index peaks from those of the general business cycle as dated by the National Bureau, since the National Bureau's general criteria for dating peaks and troughs were followed in both cases.[1] The National Bureau's measures indicate a one-month average lag of the F.R.B. Index behind general business-cycle peaks, 1919–38.[2]

The smoothed-current diffusion index had substantially the same leads

[1] Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, National Bureau of Economic Research (New York, 1947), p. 58. Substantially, the peak month is the last month before lower levels are encountered.

[2] *S.I.*, Table 2, p. 7.

over cycle peaks in the F.R.B. Index as Moore's historical diffusion index had over peaks in the general business cycle.[1] It must certainly be considered a highly satisfactory forecasting device if it is not vitiated by disadvantages in other respects. It may accordingly be concluded that the current smoothing problem is surmountable, at least in the sense that a turning point in the predicting series can be recognised some six months to a year before the corresponding turning point can be recognised in the predicted series.[2]

## Is the Diffusion Index Necessary?

But is the diffusion index necessary, or is there a more easily obtained measure that will forecast as satisfactorily? Aside from the smoothing operation, the three characteristic operations involved in a diffusion index are:

1. *Differencing* the individual series.
2. *Transforming* the differences into a two-valued system: rising or falling.
3. *Weighting* the resulting binary values equally as among series.

### *Differencing the Aggregate versus Differencing the Components*

Broida [3] has pointed out that a measure of the rate of change in an aggregate would often lead turning points just as a diffusion index does. "In periods of expansion, for example, the rate of increase in industrial production frequently would decline before the peak is reached, and be near zero around the peak. In periods of contraction, as the trough is approached, the rate of decline would tend to fall off and be near zero

[1] The only conspicuous difference is possibly with respect to the 1926 peak. There are three peaks in each predicting series, each of which might be matched with the peak in the predicted series. Their leads are twenty-two, eleven and one months, respectively. The predicting peak with the largest lead corresponds almost exactly to Moore's lead of 21 months. (Actually, the predicting peak being almost flat, its lead could be dated 21 months as appropriately as twenty-two months.) The predicting peak with the shortest lead leads the predicted peak by only one month, although the flat predicted peak might reasonably be dated five months later, so that the shortest lead would then be six months.

[2] It might be argued, in view of the lag of the availability of the data behind the months to which they refer, and the fact that it takes at least one and possibly two or three months beyond the turning point to identify it, that the forecasting lead of the currently smoothed diffusion index is too short to be useful. But whatever lag in the appearance of the data or in the interpretation thereof applies to the predictor series also applies to the predicted series. Thus, if the peak, clearly defined, of the predictor series leads the peak, equally well defined, of the predicted series by six months, and if there is a lag of two months in the availability of the data and another two months are required to recognise a turning point clearly, the corresponding total four-month lag applies to both predictor and predicted, and it will still be true that the turning point can be recognised six months earlier from the predictor series than from the predicted series. In short, the peak-to-peak lead is an appropriate measure of the effective lead for forecasting purposes if the two series are equally smooth.

[3] *Op. cit.*, p. 13.

around the trough." Moore agrees " that certain types of diffusion indexes, namely those computed by taking directions of change over identical intervals in the components of economic aggregates, are closely correlated with the rates of change in the corresponding aggregate." [1] But he claims that there is a fundamental difference in that the diffusion index focuses attention on the components of the aggregate rather than on the aggregate itself.

It is hard to see why a diffusion index, a count of the relative frequency of positive first differences of the components, should put a stronger focus on the components than a conventional index which is a weighted average of the quantitative levels of the components. In either case the final index depends upon a weighted sum of the movements of individual components and has lost sight of the individuality of those components. The fact is that the diffusion index will differ from the first difference of a corresponding aggregate only because of the transformation and weighting operations. Broida doubts that anything is gained by the transformation of quantitative information into the two-valued attributes of rising and falling. He also argues that equal weighting is likely to be inferior to weighting by importance.

A comparison of the smoothed current diffusion index based on fifteen to twenty-six components of the F.R.B. Index (curve *B*) with a comparably smoothed first difference of the F.R.B. Index (curve *C*) indicates that little is lost by the two-valued transformation and equal weighting, but little is gained either. Nothing can be inferred from either of the curves *B* and *C* that cannot be inferred from the other. The only substantial difference is the superior performance of the diffusion index in 1919–20, when some ambiguity arose in the direction of movement of the first difference just before the downturn. Otherwise, the two curves are closely comparable, with the leads evenly balanced (see Table I).

The choice between a diffusion index and the first difference of the aggregate, therefore, is almost purely one of convenience, so far as predicting turning points is concerned.

*Weighting and Transformation Effects*

The practical equivalence of curves *B* and *C*, for forecasting business-cycle turning points of curve *A*, also resolves the weighting and transformation problems. Obviously, neither the weighting nor the transformation makes critical difference, since the equally weighted and two-valued transformed diffusion index yields substantially the same information as the first difference of the carefully weighted F.R.B. Index with the quantitative differences preserved.

We may conclude, then, that the smoothing and the differencing are

[1] *American Statistician*, October 1955, p. 13.

essential to the forecasting value of these predictors, while the weighting and the transformation are not.

*The Agreement is Empirical*

A diffusion index and the first difference of a weighted aggregate index do not necessarily have to agree in their turning points. They will agree in certain circumstances, but not in others.

They can generally be expected to agree, however. When an increasing number of series is rising the average rise will usually also be increasing, and the two measures will move together. This should be our normal expectation, and it is, in fact, found to be the usual case in the data here under review.

But it is possible for the diffusion index to rise while the first difference falls. If, as the number of series rising increases, the rising series rise by declining amounts and the falling series fall by increasing amounts, the two measures may diverge. In this case the peak of the first difference can lead that of the diffusion index.

Of more interest to those who favour the use of the diffusion index is the possibility that the diffusion index may lead the first difference of the aggregate index. If, as the number of series rising decreases, the series still rising increase their rates of rise, the first difference may continue to rise even though the diffusion index is falling.

These theoretically possible differences in behaviour of the two measures do not seem to be encountered in practice, except in the form of occasional month-to-month divergences that must be considered erratic fluctuations.

Another type of divergence occurs when there is a highly intense disturbance localised in a single sector of the economy, such as a steel strike. In such cases the first difference of the aggregate is more severely affected than is the diffusion index.

In view of the high frequency of extreme items in economic time series, a diffusion index, taken over a very large number of components, can be expected to be smoother than the corresponding first difference of aggregates. The transformation operation, which cuts all quantitative variations down to the same size, can produce a smoother movement, especially when a very large number of components enter into the diffusion index, than that of the first difference of the weighted aggregate. The latter is more strongly affected by large disturbances in a small number of series, especially if they are heavily weighted.

It does appear that the same smoothing operator applied to the two predictors yields a slightly smoother curve for the diffusion index than for the first difference, especially over that period when the diffusion index is based on twenty-five or twenty-six components rather than fifteen. (Compare curves *B* and *C* from 1923 on.) It can be inferred that, were the diffusion index based on many more series, say the 175 monthly series

underlying the F.R.B. Index, it would have a substantial advantage in smoothness.[1]

A simple, early and relatively smooth approximation to the F.R.B. Index can be made by cumulating an unweighted diffusion index. It should be possible, even before the end of each month, to get for many of the 175 component activities underlying the F.R.B. Index a judgment as to whether they are moving up or down for the month. The resulting diffusion index, cumulated, will closely agree with the F.R.B. Index itself, which would become available only several weeks later. Such differences as may be observed in the two measures, and they are slight, give the advantage, for forecasting purposes, to the cumulated diffusion index.[2] The latter's small advantage in smoothness is particularly evident in the neighbourhood of turning points, so that its turning points are more sharply defined. Whatever the forecasting value of a diffusion index may be, a cumulated diffusion index clearly has a substantial value as a smooth and prompt measure of current developments, a value possibly superior to the best measures now in general use, such as the F.R.B. Index.

While the diffusion index is somewhat smoother than the first difference of an aggregate, this advantage is insignificant, so far as forecasting turning points is concerned, compared to a disadvantage common to both predictors, a tendency to produce false leads.[3]

## False Leads

Moore's historical diffusion index not only called all the cyclical turning points correctly and with a substantial lead, it never called a wrong turn, except in 1933–35. The current diffusion index, and the first differences, as shown in the chart, unfortunately call a large number of wrong turns. More accurately, there are a number of peaks and troughs in the two smoothed current predictors that do not correspond to the conventionally recognised turning points in the business cycle. Each false lead is given by both predictors, which agree as well on the false peaks and troughs as on the true ones.

As shown in Table II there were eleven "false peaks" [4] indicated on

[1] See Moore, *American Statistician*, October 1955, Chart 1, p. 15, for a dramatic illustration of the smoothing power of the diffusion index based on 225 new orders series, National Association of Purchasing Agents, as compared with the corresponding aggregate. That chart also compares the F.R.B. Index with a cumulated diffusion index based on twenty-six components of the F.R.B. Index.

[2] As can be inferred from reference of preceding footnote.

[3] The leading series approach is also subject to the same major shortcoming. See Maher, *op. cit.*

[4] Very short false leads of one to three months' duration were not counted, since they could presumably be smoothed away without introducing a lag that is long relative to the true leads. A subjective element enters into this count of false leads which could be removed only by precisely specifying the smoothing to be applied and the criteria of peak identification to be used. That is, more false leads could be identified, but not fewer, unless true leads are also to be destroyed.

upswings [1] in the period 1919–39, and 1947–56, in addition to the eight true peaks.[2] Ten of them were related to short downswings, and one to a flattening out in the rate of increase. The ten secondary half-cycles and one plateau lasted from one to ten months, except for one which lasted twenty-four months. The predicting series did not lead these downturns by more than three months, except in one recent case, and the median lead was only one month.

TABLE II

*Secondary Peaks or Plateaus Associated with "False Leads" in Current Diffusion Index*

F.R.B. Index components [a]

| Date of secondary peak or plateau.[b] | Lead of current diffusion index, months. | Length of secondary half-cycle plateau, months.[c] | Drop in F.R.B. index, % | Drop in current diffusion index, points. |
|---|---|---|---|---|
| Plateau 1/25 | 1[d] | 8 | 0 | 32 |
| Peak 11/25 | −1[d] | 6 | 2 | 23 |
| Peak 10/32 | 0 | 7 | 10 | 41 |
| Peak 7/33 | 0 | 24 | 20 | 53 |
| Peak 4/34 | 1 | 9 | 14 | 46 |
| Peak 2/35 | 0 | 6 | 2 | 22 |
| Peak 11/35 | 1 | 5 | 2 | 38 |
| Peak 1/39 | 3 | 5 | 4 | 30 |
| Peak 11/39 | 1 | 10 | 9 | 35 |
| Peak 1/52 | −1 | 7 | 2–4[e] | 15 |
| Peak 12/55 | 6–9 | 9 | 3–6[e] | 35 |

[a] Cf. footnote *a*, Table I.
[b] Dated as first month high is reached, not last as in Table I.
[c] Number of months before high is surpassed.
[d] Can also be interpreted as a longer lead over true peak.
[e] Lesser figure implies rough adjustment to eliminate effect of steel strike.

A comparison of the drops in the currently smoothed diffusion index that are associated with the false leads (final column, Table II) with the drops associated with the true business-cycle peaks up to the point where the peak appears (final column, Table I) suggests that any smoothing which could eliminate the false leads would be likely also to eliminate the leads over the true business-cycle peaks. It is true that the potentialities for smoothing depend not only on the size of the drop but also on the entire configuration of the series in the neighbourhood of the false peak. But there

[1] False peaks indicated on downswings are not counted here because they would be relevant to the preceding false troughs. They occur when one is looking for a trough, and so are merely corrections of false indications of a trough. Such peaks are indicated as "rectifying peaks" in the chart, and similarly, false troughs on upswings are called "rectifying troughs."

[2] Assuming that May 1951 was a genuine business-cycle peak. Even under the contrary assumption, the corresponding peak in the predicting series should not be counted as a false lead because the decline in the rate of increase was clearly related to governmental measures, and would not have been contemporaneously interpreted as a prediction of a recession. By the same token, 1951 might be deleted from the list of successfully predicted peaks in Table I.

is no clear difference in configuration of the predictors as between true and false peaks such as to suggest the possibility of currently smoothing out the false peaks without destroying the lead of the predictors over true peaks.

The " false leads " shown by the two predictors reflect more than merely random fluctuations in the data. They are related to genuine hesitations in the upward movements of the F.R.B. Index, hesitations which usually reflect developments that pervade the entire economy. Similar false leads are also shown by many other current diffusion indexes. Thus, Lipton's diffusion index based upon twelve statistical indicators, only five or six of which relate directly to industrial production, shows a pattern of false leads over the period 1921–39 almost identical with that shown by curves *B* and *C*.[1] An average duration of run measure applied to fifteen broadly heterogeneous statistical indicators also shows identical false leads.[2] This measure is based on month-to-month changes, and so behaves like a current, rather than an historical, diffusion index. Maher's regression of the F.R.B. Index on various leading series demonstrates not only a similar tendency to generate false leads but also a substantially similar pattern of the occurrence of the false leads.[3]

The one feature of the historical diffusion index that cannot be satisfactorily matched in a current diffusion index is, therefore, the smoothing out of false leads. Because these false leads cannot be eliminated in a current measure, the current predictors fall far short of the forecasting potential suggested by the crisp one-to-one leads of the historical diffusion indexes over business-cycle turning points.

The simple fact of the matter is that there are frequent hesitations in business-cycle upswings and downswings. A broad class of statistical indicators, which are either measures of rates of change or activities which are sensitive to rates of change, reflect these hesitations. It is not a mathematically necessary condition that every business-cycle turning point be preceded by a turning point in the rate of change, but empirically it seems to be so. Consequently, these indicators, sensitive to rates of change, generally lead business-cycle turning points; the ones considered in this paper do so without exception.

But not every hesitation *need* be followed by a business-cycle turning point, so many false leads are given. Consequently, a peak in one of these indicators can tell us that we *may* be heading into a downturn, but the chances, derived from the inter-war and post-war period, are about three to two that any particular hesitation will furnish a false rather than a true lead.[4]

[1] N.I.C.B., *Business Record*, June 1955, pp. 214–15. [2] *S.I.*, Chart 7, p. 84.

[3] *Op. cit.*, especially Chart I. Maher's regression, being less smooth, gives many more false leads, but it is clear that after some smoothing it would show many of the false leads shown by curves *B* and *C*.

[4] The chances are three to two on the assumption that the predictions are based on data smoothed to an extent consistent with the determination of the eleven false peaks of Table II. A lesser degree of smoothing would yield more false peaks.

That is, the chances are three to two that a peak in the smoothed predicting series will be associated with a secondary peak or plateau in the predicted series rather than a " real " business-cycle peak.

## Length of Lead as a Discriminant

Some forecasting value can possibly be derived from the fact that the predictors led the predicted series by six months or more in all cases of genuine business-cycle peaks, while, with only one exception, they had substantially zero lead over the downswings and plateau which must be regarded as false peaks. If, then, three months after a peak in the predictors no peak appears in the predicted series, the probability would seem to be high that the predicted downturn will actually turn out to be a significant business cycle and not a secondary peak or plateau.

The outstanding failure of this criterion in the period under review is, unfortunately, the most recent " false peak," that of December 1955 (see Table II). This " false peak " was predicted from six to nine months in advance by the smoothed current-diffusion index, and eleven months in advance by the first difference.

Even if we are prepared to dismiss this one exception as not disproving a rule which seems to apply to the ten other cases of false peaks, and to all eight cases of true peaks listed in Table I, further scrutiny reveals that the proposed discriminant would have little value in practical operation. While, as indicated in Table I, the peaks of the predictors led those of the predicted series by six to twelve months, they would not have been recognised contemporaneously as leading by so long a time. In all of the cases of true turning points listed in Table I, with the possible exception of 1953, there was, within a month or two of the peak of the predicting series, a preliminary small downturn, or at least a short plateau, in the predicted series, which was soon thereafter surpassed.

Consequently, a contemporaneous attempt to apply the proposed discriminant would have led, in at least seven out of the eight cases of true peaks, to the matching of the peak in the predicting series with preliminary false peaks which were practically simultaneous with the peaks in the predictors. It would then be concluded, erroneously, that a secondary or false peak was being forecast. The difference in lead time that we are considering as a potential contemporaneous discriminant between true and false leads turns out, therefore, to be one that can be established, in all but one case, only by hindsight.

We cannot get away from the fact that while peaks are always led by slowdowns, slowdowns do not always lead to a business-cycle peak.

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# THE EUROPEAN COMMON MARKET AND BRITISH INDUSTRY[1]

In 1955 the six countries constituting the European Coal and Steel Community—Belgium and Luxembourg, France, Germany, Italy and the Netherlands—decided to examine the possibility of freeing the whole of their mutual trade from all artificial barriers. Roughly a year later, when concrete proposals in this direction had emerged in the shape of the Spaak Report, Britain declared her intention of participating in the free-trade scheme. Since then, negotiations have been carried on about the precise form which this participation should take; as the British approach differs from that of her continental neighbours in many important respects, it is not yet certain that the United Kingdom will in fact enter a common market in Western Europe.[2] However, this does not appear to preclude discussion of one very important issue which is raised by the present proposals—the effects on particular British industries of freeing intra-European trade. This is the subject of the present paper.

As a result of removing tariffs and other impediments to the free movement of goods, a country will tend to specialise on those commodities in which it has a comparative advantage, and it will tend to give up other lines of production in which it is, by comparison, at a disadvantage. In other words, the abolition of trade barriers will induce a movement of resources from the relatively less efficient to the relatively more efficient industries. The subject matter of this paper may therefore be described more precisely as an attempt to divide the commodities produced by British industry into two groups—the first comprising those commodities which have a comparative cost advantage, and the second those which are at a comparative cost disadvantage. In other words, the first group comprises goods which can be produced more cheaply in Britain, relative to the goods in the second group, than on the Continent, and the second group comprises goods which can be produced only at a higher cost in Britain, relative to the cost of producing the goods in the first group, than they can in Western Europe. Commodities found in the first category are therefore likely to do well in a common market—viz., not only will the particular industries concerned retain their home market, but they would also be expected to increase their exports to the Continent; on the other hand, industries

[1] This is a slightly amended version of a paper read before Section F of the British Association for the Advancement of Science at its 1957 annual meeting in Dublin. I am deeply indebted to Mr. Rodney Crossley for compiling most of the statistics, and to Professor J. E. Meade for suggesting a number of important changes in the exposition. My wife rendered valuable assistance at every stage of the work.

[2] The terms "common market," "free trade area," etc., will be used interchangeably in this paper, as the distinctions which exist do not matter for our purposes.

producing commodities found in the second category would probably find it increasingly difficult to retain a substantial share of their internal market, and would also tend to lose any continental sales which they might at present enjoy.[1]

One point, closely related to the above, deserves particular emphasis, because it appears to have been the subject of much confusion. It has been suggested in some quarters—which are not usually very amiably disposed towards the common-market project—that free trade in Western Europe would have depressing effects on British industry in general and that it would lead to balance-of-payments difficulties, unemployment and social losses, although a few lines of production, such as the manufacture of aircraft and atomic-energy equipment, might benefit. On the other hand, enthusiastic supporters of the project have predicted that, apart from a few exceptions, such as the cotton sector, firms in this country could easily stand up to unfettered foreign competition and would, in fact, register substantial gains in European markets.

It is true that these propositions represent possible alternative short-term situations, although they both fail to impress one as realistic forecasts; however, they cannot in general be regarded as possible long-term equilibrium positions. It is one of the essential tenets of the law of comparative costs on which any discussion of this issue is ultimately based that if the free trade countries maintain balance-of-payments equilibrium any increase of output and of exports in some lines of production, brought about by the institution of free trade, will be accompanied by a decrease of output and an increase of imports in other lines. Professor Meade's paper "The Balance-of-payments Problems of a European Free-trade Area" (cf. ECONOMIC JOURNAL, September 1957) dealt with the methods by which chronic balance-of-payments surpluses and deficits may be avoided in a free-trade area, and therefore I do not propose to discuss this matter further; in this paper I shall merely assume that in the long-run balances of payments will more or less be kept in equilibrium. In such a situation it is not possible for all or nearly all industries to expand or to contract; if Britain has a comparative advantage in some industries, which therefore tend to expand, she will *ipso facto* have a comparative disadvantage in some other industries, which will therefore tend to contract.

It may appear unnecessary to give such emphasis to what most people will regard as very obvious points, but they do need to be clearly understood

[1] It may be asked how it is at present possible for Britain to export to the Continent those goods in which she is, relatively speaking, at a comparative cost disadvantage, as such a disadvantage should theoretically tell against the products concerned when they are sold abroad. Two main reasons may be advanced for the existence of such exports. First, the export goods concerned may be highly specialised, and secondly, the industries concerned may pursue discriminatory pricing policies. In so far as the first point holds, exports may continue even if the internal market is invaded, but if—as the author believes—the second reason is the more important one, then the loss of the home market would obviously also reduce exports to the Continent.

not only for the purpose of this paper, as will become clear below, but also for a correct appreciation of the whole common-market project.

I now come to the main part of this paper—the prospects for the different commodities produced by British industry, or technically speaking, a study of comparative costs in Britain relative to those on the Continent. It will hardly be necessary for me to point out the enormous difficulties which any attempt to make a reliable forecast cannot fail to encounter. Much water will flow under Europe's bridges before free trade in Western Europe is established, and many important aspects of the whole problem may well change in the meantime. Nevertheless, it should at least be possible to give an indication of likely trends, and this is what I have tried to do.

There appear to be at least three ways of ascertaining the position here. First of all, there is the European census of production. If it were possible to hold a detailed statistical inquiry into the whole of industry in each of the member countries of a common market, using the same methods of investigation, comparable material could be collected which should serve as a fairly accurate guide as to what would happen once trade barriers have been abolished. Evidently, such a census of production, if it were to be undertaken at all, could be staged only by an authoritative international body which could command the necessary funds; it would obviously be far beyond the reach of an individual investigator like myself. One might attempt to use the existing national censuses of production for our purposes, but even then the work involved would very likely be enormous; moreover, the additional pitfalls which such a course of action would entail might well render the results a good deal less reliable.

Secondly, one might approach firms and industries in Britain and perhaps also on the Continent and ask them how they expect their particular products to be affected by the common-market project. As most enterprises should be able to evaluate the relative position of their Continental competitors, this method is also likely to yield fairly sound results. Difficulties may, however, arise because the crucial assessments are being made by different people, probably on the basis of different kinds of information, and possibly relating to different aspects of the effects of the common-market venture.

This second way has been followed by all the inquiries which I personally know of, and this is the main reason why I decided against it. Instead, I have attempted to judge the prospects of different British products by their relative success (or failure) in export markets in the last few years. The basis of my argument, therefore, is the assumption that Britain has a comparative cost advantage in those products which in the recent past have enjoyed relatively large sales in markets where they are in direct competition with rival products from the Continent, and that she is, by comparison, at a disadvantage with regard to those products which, relatively speaking, have been outdone by exports from Britain's European competitors. On

the whole, this appears to be a reasonable hypothesis, although there are a number of difficulties connected with this approach which will be discussed below.

My first task is to describe in somewhat greater detail the investigations which I have carried out. I began by comparing the absolute level of British exports of sixty manufactured commodities to Western Europe with those of each of the six European Coal and Steel Community countries and of Sweden during the period 1953–56. In many cases a test of this nature will yield reliable results, but there are dangers in using absolute export levels only; it is possible that although some British industries enjoyed relatively large sales during these years they rapidly lost ground over the period, and vice versa. Hence the above set of data was supplemented with the rate of increase of exports in each group from each of the countries to Western Europe between 1953 and 1956. The absolute levels of sales and the rates of increase formed the basic material. In addition, the ratio of British exports of each item to Western Europe to British imports of the same item from Western Europe was examined.

The sixty commodities chosen include nearly the whole range of manufactured goods. I have attempted to make the items as homogeneous as the basic data will allow, but there are a few instances in which the existing statistics do not provide a detailed breakdown, with the result that the composition of such items may vary substantially from country to country. Thus if one takes a first preliminary glance at the table it will be found that only two entries are available for electrical goods—" other electrical goods " and " electric generators, transformers, etc.," ranked as Nos. 30 and 31 respectively. The first group may comprise such different commodities as electric-light bulbs and radio equipment, electronic apparatus and automatic toasters. Therefore, generators apart, my data cannot help me to assess the prospects for different branches of the electrical industry, although I can say something about electrical goods as a whole. Likewise for Nos. 21 and 54.

The countries to be considered in this comparison really chose themselves, except perhaps Sweden, but as her exports of manufactures are quite large in some lines, and as she may well become a member of a free European market, it seemed wise to include her.

The choice of years was likewise a straightforward matter. What I required was a recent period, not so short as to give undue emphasis to the effects of random disturbances, and in general representing as closely as possible " normal " trading relationships. The period from 1953 to 1956 appeared to be by far the best choice.

A brief word also about the market selected for the comparisons. The choice naturally fell on Western Europe, or, in terms of the trade statistics, the " remaining O.E.E.C. member countries combined," although, for a number of reasons, this could lead to distorted results. Perhaps the most

serious difficulty arose because for each single country's exports the destination " remaining O.E.E.C. countries combined " includes all the other competitors. This means that when one is, for example, comparing the United Kingdom with Western Germany, British exports include sales to Western Germany, but not, of course, sales to the United Kingdom, and German exports include sales to Britain, but not, of course, to Western Germany, with the result that one is not in fact contrasting the performance of German and of British exports in the same market. If one could generally assume that in the two countries market conditions for the other's products, including tariffs and other trade restrictions, were fairly similar, this would not matter much, but there is probably little justification for such an assumption. The best solution would be the exclusion of all mutual trade, but there was no time for the heavy additional work involved, and therefore the export figures do include the mutual exchange in each product group. However, a wide sample indicated that this imperfection in the basic data affects our analysis only to a very minor extent, and hence it does not appear that the validity of the investigation is greatly impaired in consequence.

A second, related difficulty springs from the remnants of discrimination in the O.E.E.C. market. It is true that as a result of the O.E.E.C. liberalisation programme and of the multilateral payments mechanism of the European Payments Union most of the trade in Western Europe is now free from discriminatory influences. However, many O.E.E.C. countries still maintain a hard core of import restrictions, some of which favour certain suppliers more than others; also, nearly all British products enjoy preferential treatment in Ireland; and finally, the institution of the European Coal and Steel Community has created a free trade area with regard to certain products in Western Europe from which the United Kingdom is at present excluded. In this last case the effects upon relative exports are very noticeable, and therefore the comparison of sales of iron and steel products (No. 54 in the table) is not very meaningful, but how far the other divergences from a non-discriminatory market are important is difficult to establish offhand, though the probability of major distortions arising appears to be small.

I have devoted some attention to the details of my approach so as to put the analysis into its proper setting. I shall now move on to the results of the investigation presented in the table. This is rather a long and complex table, because I thought it appropriate to provide as much information as possible, but nevertheless it should not prove too difficult. In any case, if one does not intend to probe into the facts lying behind the results, one need go no further than column 1, which ranks the sixty commodities in the order of their relative success in Western European markets, beginning with the best and ending with the worst performers.

Column 2 contains the annual average of the absolute value of United Kingdom exports of each product to Western Europe during 1953–56, and the figure underneath shows British exports of each item in 1956 as a per-

centage of those in 1953. We will call this the index of growth of British exports. Thus during 1953–56 British exports of aircraft to Europe averaged £40·7 m., and the index of growth was 157%.

Column 3 contains the data relating to Britain's three most important competitors, from which the ranking of the sixty product groups is derived. The figures are expressed as percentages of the relevant British figures, and the capital letter denotes the particular country concerned. Taking the case of aircraft again, the top row indicates that exports from Italy, Britain's nearest rival, were only 10·3% or about one-tenth of the British total; next came the Netherlands, with 8·9%, and then Belgium/Luxembourg, with 3·6%. We will call these figures the indices of relative levels. The second row shows the indices of growth of exports of aircraft from Italy and Belgium/Luxembourg as percentages of the index of growth of British exports of aircraft.[1] Thus, the index of growth of Italian exports of aircraft (not given in this table) was 203·5%, which is 129·8% of the British index of growth, and the index of growth of exports from Belgium/Luxembourg (again not given in this table) was 690%, which is 440% of the index of growth of British exports. We will call these figures the indices of relative growth.

The table therefore contains one set of absolute figures—the annual average of the value of United Kingdom exports—and three sets of indices: the indices of growth of British exports—exports in 1956 as a percentage of those in 1953; the indices of relative levels—the absolute value of exports sold by Britain's rivals expressed as a percentage of absolute British exports; and the indices of relative growth—the index of growth of exports of Britain's main rivals expressed as a percentage of the British index of growth.

I do not propose to go through the results commodity by commodity, for this would take up far too much space; rather, I shall comment on some of the more general aspects of the table, using particular items as examples wherever appropriate.

As a brief examination of column 3 will show, the figures relating to Britain's competitors present anything but a clear-cut picture. In particular, the indices of relative levels and the indices of relative growth often give conflicting results. Compare, for example, Nos. 10 and 18—woollen and worsted fabrics, and aluminium. Taking aluminium first, Germany exported slightly more to Western Europe than did Britain, and France as much; the third competitor—Belgium/Luxembourg—was relatively unimportant. On the other hand, both Germany and France, especially the latter, lagged behind the United Kingdom's rate of increase. In the case of woollen and worsted fabrics, the position is more or less the reverse. The absolute value of British exports was larger than that of any competitor, the nearest rivals being Italy and Belgium/Luxembourg. In contrast, the index of growth of British exports is very much lower than those for her

[1] The Dutch figure is not available in this particular case.

chief rivals, the figure for Italy being particularly high. In other words, aluminium shows up worse than woollen fabrics as regards the indices of relative levels, but shows up better as regards the indices of relative growth. There appears to be no *a priori* way of settling the question as to which of these two products should be regarded as the more successful line, it all depends upon the relative weights accorded to absolute values and rates of change respectively by individual examiners, and here opinions will very likely differ. In my view, the absolute values are on the whole somewhat more telling than the rates of change, largely because rates of change are of necessity calculated from two single years, and are therefore much more liable to be distorted by random shifts in the pattern of trade than are averages. In addition, the significance of a rate of change very much depends upon the relative size of a country's exports; a doubling of your sales abroad is very much easier if you start with only a small share of the market than it is if you are already the dominant exporter.

For these reasons, I made the following adjustments. In order to meet the last point above, the indices of relative growth were weighted with the indices of relative levels; the resulting figures were then divided by 2 so as to give less emphasis to the rates of change, and finally added to the indices of relative levels themselves. With one figure only for each country, the ranking presented little further difficulty—by adding the results for the three countries together, all the information about each product was reduced to one single figure.[1]

Of necessity, these adjustments have been rather arbitrary, and one might equally well have followed another procedure, with different results emerging. However, the precise order in which the commodities are ranked is not really of great importance for our purposes. All that really matters is the overall positioning of any product in the table, and in view of the marked decline in the standard of performance as one moves down the table this is much more rigidly circumscribed. In other words, unless one changed the whole approach—*e.g.*, by giving to the indices of relative growth substantially greater emphasis than to the indices of relative levels—the ranking of our sixty products is likely to be much the same as that shown in the table whatever the precise procedure adopted.[2]

[1] *E.g.*, the ranking number for group (2)—tractors—is derived as follows. The relative performance of German exports is $\frac{190{\cdot}8 \times 0{\cdot}712}{2} + 71{\cdot}2 = 139{\cdot}1$; that of Italian exports is $\frac{397{\cdot}0 \times 0{\cdot}05}{2} + 5{\cdot}0 = 17{\cdot}9$; and that of Swedish exports is $\frac{191{\cdot}0 \times 0{\cdot}057}{2} + 5{\cdot}7 = 11{\cdot}1$. The ranking number for tractors, therefore, is 168·1. In four instances the rate of increase of exports is not available for one of the three competitors, and therefore it is impossible to calculate indices of relative growth. As all four cases are only of small quantitative significance, a "likely" rate of growth was simply guessed at when the ranking number was calculated.

[2] Two alternative methods of ranking were tried by the author. The first consisted of dividing the unadjusted indices of relative growth by 2 and then adding them to the indices of relative levels; in the second instance, the weighted indices of relative growth were added to the indices of relative levels without the division. In both cases results very closely approximated those in the table.

Further support for the ranking shown in the table comes from the following test. Unless the less-efficient industries in Britain are protected more strongly than the more progressive lines of production, one would expect present imports of those commodities in which Britain has a comparative advantage to be smaller, relative to export sales of the same commodity, than imports of those goods in which she is comparatively less efficient. I therefore calculated the ratio of the exports of each product group to Western Europe over the imports of the same product group from Western Europe during the average of our four years 1953–56, and then ranked the results. The list of commodities which emerges bears a fairly close resemblance to that presented in the table, and the rank correlation coefficient works out at 0·725. This is quite a satisfactory result, especially as a rough examination of the tariff indicated that the less-efficient industries in fact enjoy a somewhat higher level of protection than those in which Britain appears to have a comparative advantage.

The other major comment on the table which I think should be made relates to the fact that in general the United Kingdom's record in the Western European market is worse than that of her competitors. As a closer glance at column 3 will show, in the great majority of cases average British exports have been lower in absolute value than those of Germany, the most important exceptions being aircraft (No. 1), tractors (No. 2) and woollen fabrics (No. 10), and frequently the United Kingdom takes only a third or fourth place; moreover, the rates at which her sales have expanded are nearly always lower than those of several of her rivals. There are, of course, explanations for these facts; for example, Germany's predominance in Western Europe is more than offset by heavier British sales elsewhere, especially in the Commonwealth, and the relatively slow growth of British exports of manufactures is at least partly due to the degree of inflationary pressure in Britain, which exceeded that in most Continental countries. However, the reasons for Britain's failure to show up well are not really very significant for this analysis; what is much more important is to remind oneself that a relatively poor performance on the part of most British exports does not mean that by and large British industry will be affected adversely by the creation of a common market. As I pointed out at the beginning of this paper, it is highly unlikely that either the extreme optimists or the extreme pessimists will be correct, unless we allow for chronic and marked balance-of-payments disequilibria; if we assume that trade will be roughly balanced,[1]

[1] This, of course, does not mean that there must be a balanced exchange of manufactures between Britain and Western Europe; as Professor Meade points out (cf. ECONOMIC JOURNAL, September 1957, pp. 378–80), the object of balance-of-payments policy for a member of a free-trade area will be the same as that for any other country—*i.e.*, an overall balancing of international payments. However, it is hardly feasible that this object could be attained if there were any radical changes in the overall economic structures of the participating countries (*e.g.*, in the distribution of resources as between industry and agriculture), such as are implied in the more extremely optimistic or pessimistic views concerning the effects of free trade on British industry.

then the dividing line between promising and suspect industries will probably lie somewhere half-way down the order, though for a number of reasons which I will mention below, it is impossible to predict its exact position. What the table is intended to do is to indicate the position of different British export goods relative to one another, by means of comparing the performance of each product with that achieved by the corresponding exports of other countries; whether from some absolute point of view British products have on the whole been successful in Western Europe or not is quite a different question, and one of little concern to us here. In other words, our chief interest lies in the comparative-cost position in Britain, *i.e.*, the costs of different products relative to one another, as compared to the situation with regard to the same goods on the Continent, and it is on this point that we look for guidance from our table. If we were to concentrate on the absolute performance of British goods we would be moving along the same channels of thought as the person who reasons about international trade in terms of absolute and not comparative costs, thereby disregarding the whole of the theoretical development of this subject since Ricardo.

There are, however, a number of reasons why the figures in the table may fail to indicate the comparative-cost position correctly. One factor in particular should be mentioned. Above I touched upon the probable influence of inflationary pressure upon the various countries' exports. If one could assume that the degree of this pressure had been more or less the same as far as any one counry's exports are concerned, the relative position of our sixty commodities would not be disturbed. However, such an assumption can hardly be made; *e.g.*, it would be difficult to find much support for the hypothesis that because of excess demand at home all British industries had in equal measure been prevented from maintaining their export sales, and likewise for the other countries. This means that the relative position of our sixty commodities may be influenced not only by comparative costs in Britain and in Western Europe, but also by the incidence of inflationary pressure in Britain and on the Continent, with the result that our findings may be distorted. To some extent one may be able to assume that on the Continent and in Britain the same commodities were in short supply, and then our figures stand, but a great deal of effort would be required to prove or disprove this hypothesis.

Let me give an example of the kind of problem I am talking about. No. 55 in the table is cement. As its position in the table indicates, the performance of this commodity was poor. Moreover, it also shows up badly in the second test, which is the relation of British exports to O.E.E.C. countries to imports from O.E.E.C. countries. The conclusion is that the cement industry will do badly in a European common market. However, suppose that cement were particularly scarce in Britain during our period, whereas it would relatively easily have been obtained on the Con-

tinent. Such supply conditions would lead to low exports from Britain, although cement might in fact be a commodity in which this country had a comparative advantage. Given a few years in which to investigate internal markets for each of our products, this kind of error could be narrowed down; all I can do here is to hope that distortions are not too serious.

It is not difficult to think of further reasons why my results may not give a correct picture of the comparative cost position. Therefore I would again point out that the precise order in which the commodities are arranged must not be taken as anything very definite; all that I think can be claimed for my data is that, allowing for some exceptions, they probably indicate the overall position of the different commodities correctly.

There is one final aspect of the figures in the table which is worth mentioning. There do not appear to be any very definite results which emerge with regard to broad sectors of industry. *E.g.*, one cannot say that Britain has a definite comparative advantage in engineering products, for it will be found that whilst aircraft, tractors and power-generating machinery occupy the first three places in the table, passenger cars, commercial vehicles, office machinery and machine tools are placed very much farther down in the order. It is true that engineering goods are on the whole to be found in the upper half of the table, but the spread is still remarkable. Likewise for chemicals—inorganic and especially organic chemicals are placed a long way down the list, whereas chemical products, such as paints and varnishes, or cosmetics, soaps and polishes, are in a very much better position. The same again holds for the textile industry; woollen fabrics show up well, and cotton and woollen yarns also appear in the upper half of the table, whereas cotton fabrics and synthetic yarns are placed farther down in the ranking order, and synthetic fabrics are among the last ten commodities. The upshot is that if the table does rank our sixty products more or less accurately, the prospect is one of relative gains and losses within each industry; thus soaps will do better than organic chemicals, tractors better than office machinery, etc. On the whole, this seems to be a rather plausible result. For different industrial groupings—say "new products" and "old products"—one may be able to obtain more systematic results.

It may have been noticed that I expressed myself in rather vague terms above when I discussed the prospects for different industries—I talked about "relative" gains and losses, and about some products "doing better" than others. This was done quite deliberately, for as it stands the table does not allow one to say anything else. The results of the investigation so far indicate the relative position of any one of sixty products; *e.g.*, No. 24—agricultural machinery—should do better than any of the goods farther down the list, but worse than any of the preceding items. This, however, does not imply anything definite with regard to the absolute prospects of any commodity; thus, we still do not know whether production and

exports of agricultural machinery will expand rapidly, or whether there will be little change, or whether imports will exert a steadily mounting pressure, assuming again that total trade is balanced. In other words, there has as yet been no attempt to divide the sixty commodities into the two groups mentioned at the beginning of this paper; as I then indicated, those commodities placed above the dividing line would do well in a common market, and those below would find life increasingly difficult. In many ways, this is the sixty-four-thousand-dollar question, but unfortunately it cannot be answered, and therefore I shall not win the sixty-four thousand dollars. Nor will anybody else, I will hasten to add, because a number of factors make it impossible to solve this problem without a great deal more information about our economy than is ever likely to be available.

Let me indicate the kind of difficulties which I have in mind by means of an example. Suppose the common market becomes established. Tariffs and other trade barriers are reduced all round, and in consequence some British products, such as tyres or power-generating machinery, will do increasingly well on the Continent; other British industries—say, cars and buses—may not be affected much either way, because there may not be any great comparative cost advantage or disadvantage; and yet other products, such as synthetic fabrics, may feel the pinch of increased competition on the home market. In other words, I am arbitrarily assuming that initially the dividing line lies more or less across the middle of my table. However, it is quite possible that the additional imports which the freeing of trade stimulates exceed the additional exports; a lower price for British tyres on the Continent may lead to smaller increases in exports than the expansion in British imports of rayon goods following the fall in the import price, and likewise for other products. If the British balance of payments was initially in balance,[1] it will now show a deficit, and this deficit will have to be removed by exporting more and/or importing less. In the long run this can be achieved only by a lowering of money prices in Britain relative to those on the Continent, *i.e.*, by inflation on the Continent, deflation in Britain, or an alteration in the exchange rate. In terms of my table this would mean that those goods doing well already would be doing better still; some of those so far in an indifferent position would begin to do well, and the number of those in acute difficulties would decline. In other words, the group comprising commodities in a relatively strong position would reach farther down the table, and that comprising those in a relatively weak position would contract. Needless to add, the opposite process—Britain's balance-of-payments position becoming a surplus one following the removal of trade barriers, and the dividing line being pushed up in consequence—is equally possible. Thus the reactions on the demand side to the freeing of trade will

[1] Viz., Britain's overall payments *vis-à-vis* the whole world. Britain's trade with Europe, of course, need not balance either before or after the creation of a common market. Cf. also p. 309 footnote 1, above.

help to determine at which point in our table we leave the industries which are likely to expand and reach those which are likely to decline.

But it is, of course, impossible to forecast demand reactions; moreover, many other difficulties, no less formidable, are bound to arise. For these reasons, all that one can say is that this division is not likely to occur at either extreme end of the table; in other words, the products at the top of our table—say the first fifteen—certainly look like doing well, and those at the bottom—say the last fifteen—will very probably find themselves in a difficult spot. Therefore, such commodities as tractors, soaps, tyres, plastics and bicycles will probably be able to expand their output and exports, whilst such items as glass and glassware, pottery, travel goods and, perhaps not surprisingly, watches and clocks may well be affected adversely. The fate of the thirty commodities in the middle is much less predictable, except that the probability of success declines as one moves down the table. An unsatisfactory outcome, I know—but as I pointed out before, this is not the fault of my particular approach; none of the methods I have mentioned can get around this difficulty.

It only remains for me to point to one other feature of my findings. I mentioned above, in another context, that there is a good deal of difference between the best and the worst performers. In other words, some British products were very much more successful on the Western European market than others. This is not a result one could have predicted with any degree of certainty; it would have been quite possible to find that on the whole there was little to choose between different British goods.

What is the significance of this definite spread of our results? Although this is not the only interpretation one could advance, I would suggest that the marked rate of decline in the standard of performance as one moves down the table at least partly reflects a similarly marked difference in comparative cost conditions as between this country and the Continent. In other words, the figures in the table seem to me to indicate that there is a substantial difference between British industries as regards efficiency as compared with the position on the Continent. If this interpretation is accepted, important conclusions follow with regard to the desirability of the whole common-market venture. The United Kingdom will gain from participation in the common market by specialising on those lines of production she is relatively good at, and giving up other lines in which she is relatively inefficient. Although the size of this gain is determined by a number of factors, amongst them the availability of further economies of scale in Britain and on the Continent, it will to a large extent depend on the difference in comparative costs in Britain as compared with those on the Continent; the larger the difference in comparative costs, the greater the gain will probably be, and vice versa. Therefore, if my findings are correct, and if my interpretation is not mistaken, free trade in Europe may well be able to contribute substantially to a higher standard of living in Britain.

*British Exports of Manufactures to Western European Markets Ranked in the Order of their Success Relative to the Exports of Main Competitors* (1953–56)

| Ranking order. | Commodity (S.I.T.C. numbers in brackets). | U.K. exports: absolute levels and indices of growth,* $ m. and %. | Britain's three strongest competitors (indices of relative level and indices of relative growth) † | | |
|---|---|---|---|---|---|
| 1 | Aircraft (734) | 40·7<br>*157·0* | I 10·3<br>*129·8* | N 8·9<br>*n.a.* | B/L 3·6<br>*440·0* |
| 2 | Tractors (713) | 53·5<br>*99·5* | G 71·2<br>*190·8* | I ·6·0<br>*397·0* | S 5·7<br>*191·0* |
| 3 | Power-generating (excluding electric) machinery (711) | 70·1<br>*193·0* | G 107·0<br>*64·2* | I 18·1<br>*73·2* | N 14·8<br>*97·4* |
| 4 | Cosmetics, soaps and polishes (552) | 16·0<br>*207·4* | G 53·1<br>*107·4* | F 46·2<br>*62·8* | N 34·0<br>*31·1* |
| 5 | Rubber tyres and tubes (629 01) | 18·3<br>*112·2* | G 50·0<br>*198·2* | I 40·8<br>*119·6* | B/L 40·5<br>*122·9* |
| 6 | Paints and varnishes (533) | 13·5<br>*160·0* | G 111·9<br>*120·8* | N 34·6<br>*105·5* | S 11·2<br>*180·6* |
| 7 | Nickel (683) | 20·3<br>*114·3* | G 18·2<br>*432·0* | F 9·8<br>*2,950·0* | S 1·0<br>*942·0* |
| 8 | Mineral tar and related crude chemicals (521) | 3·8<br>*103·8* | N 71·5<br>*156·8* | G 70·8<br>*107·8* | B/L 46·9<br>*59·2* |
| 9 | Textile machinery and accessories (716 01) | 44·7<br>*97·8* | G 124·6<br>*179·6* | B/L 21·1<br>*167·6* | F 19·2<br>*126·9* |
| 10 | Woollen and worsted fabrics (653 02) | 55·1<br>*108·9* | I 82·6<br>*229·5* | B/L 47·8<br>*135·4* | N 36·6<br>*89·1* |
| 11 | Plastics (599 01) | 26·2<br>*177·9* | G 149·2<br>*143·6* | N 28·4<br>*140·2* | B/L 27·0<br>*90·0* |
| 12 | Road vehicles other than motor (mainly bicycles) (733) | 8·8<br>*109·8* | G 149·9<br>*180·5* | F 26·4<br>*94·9* | N 24·3<br>*65·8* |
| 13 | Leather (611) | 19·0<br>*105·3* | F 114·0<br>*116·9* | G 70·1<br>*142·1* | B/L 37·4<br>*99·4* |
| 14 | Ships and boats (735) | 67·2<br>*223·4* | G 108·8<br>*111·5* | S 107·9<br>*59·5* | N 46·0<br>*22·6* |
| 15 | Articles made of pulp and paper (642) | 6·1<br>*149·2* | G 106·0<br>*188·2* | N 76·8<br>*98·7* | F 38·3<br>*119·2* |
| 16 | Railway vehicles (731) | 12·8<br>*191·2* | G 149·1<br>*56·2* | F 85·0<br>*146·4* | B/L 34·6<br>*71·3* |
| 17 | Road construction and mining machinery (716 03) | 30·0<br>*108·8* | G 202·1<br>*134·5* | F 17·5<br>*115·2* | S 13·3<br>*144·0* |
| 18 | Aluminium (684) | 9·2<br>*145·9* | G 128·2<br>*91·4* | F 99·4<br>*39·4* | B/L 38·7<br>*236·6* |
| 19 | Medicinal and pharmaceutical products (541) | 16·5<br>*111·9* | G 125·7<br>*146·0* | F 75·3<br>*96·5* | N 46·9<br>*207·2* |
| 20 | Miscellaneous non-ferrous base metals (689) | 3·9<br>*163·7* | B/L 143·8<br>*126·3* | I 62·1<br>*175·2* | G 44·3<br>*114·4* |

* The indices of growth of British exports (in italics) represent exports in 1956 as a percentage of those in 1953.

† The indices of relative level (in normal type) represent the absolute level of exports of each item sold by Britain's rivals as a percentage of the absolute level of British exports of the commodities concerned. The indices of relative growth (in italics) represent the indices of growth of exports of each item (exports in 1956 as a percentage of those in 1953) from each of the competitors concerned as a percentage of the index of growth of the corresponding British exports. Cf. also p. 307 in the text.

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| Ranking order. | Commodity (S.I.T.C. numbers in brackets). | U.K. exports: absolute levels and indices of growth, $ m. and %. | Britian's three strongest competitors (indices of relative level and indices of relative growth). | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Other industrial machinery (716 *other*) | 112·3<br>*125·1* | G | 218·9<br>*133·3* | S | 40·5<br>*114·0* | F | 25·3<br>*133·3* | | |
| 22 | Cotton yarn and thread, grey, etc. (651 03) | 10·9<br>*52·9* | B/L | 137·0<br>*155·2* | N | 43·5<br>*249·3* | I | 25·6<br>*85·4* | | |
| 23 | Photographic and cinematographic supplies (862) | 8·8<br>*116·4* | B/L | 199·4<br>*94·8* | G | 80·6<br>*176·4* | F | 34·5<br>*120·6* | | |
| 24 | Agricultural machinery and implements (712) | 15·7<br>*99·6* | G | 208·2<br>*190·6* | S | 59·9<br>*123·5* | F | 24·8<br>*80·3* | | |
| 25 | Coal-tar dyes and natural indigo (531) | 7·2<br>*110·2* | G | 307·9<br>*117·0* | F | 40·5<br>*135·2* | I | 9·6<br>*133·2* | | |
| 26 | Cotton yarn and thread, bleached, etc. (651 04) | 5·9<br>*77·0* | B/L | 195·0<br>*164·2* | F | 83·3<br>*n.a.* | I | 63·8<br>*235·5* | | |
| 27 | Yarn of wool and hair (651 02) | 22·8<br>*233·8* | F | 264·4<br>*55·8* | B/L | 199·0<br>*46·3* | G | 32·6<br>*57·7* | | |
| 28 | Buses, trucks and lorries (732 03) | 14·4<br>*97·0* | G | 216·7<br>*199·9* | F | 57·0<br>*89·7* | B/L | 45·7<br>*273·5* | | |
| 29 | Passenger cars (732 01) | 83·1<br>*104·8* | G | 217·7<br>*219·0* | F | 55·3<br>*178·8* | I | 38·3<br>*176·5* | | |
| 30 | Other electrical goods (721 *other*) | 82·1<br>*138·4* | G | 220·4<br>*163·1* | N | 108·2<br>*101·0* | B/L | 42·1<br>*152·0* | | |
| 31 | Electric generators, transformers, etc. (721 01) | 18·4<br>*101·5* | G | 316·4<br>*148·2* | F | 40·1<br>*143·2* | B/L | 36·5<br>*112·6* | | |
| 32 | Copper (682) | 38·8<br>*234·2* | B/L | 312·6<br>*63·0* | G | 127·5<br>*71·3* | S | 73·8<br>*62·6* | | |
| 33 | Office machinery (714) | 10·6<br>*135·9* | G | 228·5<br>*140·4* | I | 110·2<br>*140·3* | S | 88·8<br>*111·9* | | |
| 34 | Inorganic chemicals (511) | 25·2<br>*111·6* | G | 246·8<br>*149·1* | F | 111·3<br>*132·6* | B/L | 77·5<br>*117·4* | | |
| 35 | Cotton fabrics (standard type) (652) | 25·5<br>*67·2* | G | 201·1<br>*172·5* | B/L | 122·7<br>*165·9* | N | 80·4<br>*192·9* | | |
| 36 | Yarn and thread of synthetic fibres (651 06) | 8·8<br>*126·8* | G | 204·0<br>*103·6* | F | 180·0<br>*119·2* | I | 133·0<br>*82·2* | | |
| 37 | Paper and paper board (641) | 10·5<br>*165·5* | N | 250·2<br>*91·8* | G | 160·2<br>*106·7* | B/L | 133·0<br>*81·8* | | |
| 38 | Dyeing and tanning materials (532) | 1·0<br>*110·4* | F | 185·7<br>*106·3* | I | 135·4<br>*320·4* | G | 109·5<br>*114·0* | | |
| 39 | Machine tools for working metals (715 01) | 15·8<br>*111·1* | G | 454·6<br>*108·7* | F | 49·6<br>*40·2* | I | 37·9<br>*105·0* | | |
| 40 | Footwear (851) | 4·1<br>*108·5* | I | 163·7<br>*353·9* | G | 126·8<br>*235·0* | N | 106·6<br>*n.a.* | | |
| 41 | Scientific and other instruments (861) | 15·0<br>*141·2* | G | 411·4<br>*127·3* | F | 60·6<br>*93·5* | N | 48·4<br>*274·8* | | |
| 42 | Leather manufactures (612) | 1·1<br>*97·4* | G | 246·3<br>*192·5* | B/L | 116·8<br>*137·0* | N | 113·9<br>*169·6* | | |
| 43 | Organic chemicals (512) | 24·6<br>*80·0* | G | 345·0<br>*174·8* | F | 69·1<br>*208·0* | N | 39·3<br>*330·2* | | |

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| Ranking order. | Commodity (S.I.T.C. numbers in brackets). | U.K. exports: absolute levels and indices of growth, $ m. and %. | Britain's three strongest competitors (indices of relative level and indices of relative growth). | | |
|---|---|---|---|---|---|
| 44 | Sanitary, heating and lighting fixtures (812) | 5·1<br>*100·1* | G 294·0<br>*220·7* | F 87·7<br>*139·5* | N 79·1<br>*164·2* |
| 45 | Furniture and fixtures (821) | 3·0<br>*129·2* | G 317·1<br>*240·7* | N 148·7<br>*68·7* | F 48·7<br>*88·7* |
| 46 | Prefabricated buildings (811) | 0·3<br>*418·9* | G 909·6<br>*7·1* | S 76·8<br>*3·5* | N 45·7<br>*32·0* |
| 47 | Glassware (665) | 3·3<br>*147·3* | G 419·4<br>*141·2* | B/L 170·1<br>*135·4* | F 154·6<br>*106·4* |
| 48 | Fabrics of jute (653 04) | 0·6<br>*93·6* | G 345·3<br>*68·4* | B/L 313·0<br>*190·2* | F 107·5<br>*156·8* |
| 49 | Glass (664) | 3·8<br>*170·6* | B/L 527·0<br>*96·7* | G 222·9<br>*97·2* | N 147·5<br>*85·0* |
| 50 | Essential oils (551) | 2·0<br>*177·0* | F 546·5<br>*78·1* | I 368·9<br>*67·1* | N 158·9<br>*n.a.* |
| 51 | Fabrics of synthetic fibres (653 05) | 7·6<br>*76·2* | G 511·2<br>*161·0* | I 191·8<br>*99·3* | F 135·8<br>*173·6* |
| 52 | Pottery (666) | 2·5<br>*118·3* | G 848·2<br>*115·3* | F 68·2<br>*98·1* | N 63·2<br>*110·9* |
| 53 | Tin (687) | 7·4<br>*50·7* | N 459·7<br>*362·0* | B/L 61·1<br>*605·1* | G 15·3<br>*79·2* |
| 54 | Iron and steel (681) | 91·1<br>*90·6* | B/L 382·3<br>*181·5* | F 300·8<br>*202·5* | G 270·8<br>*211·4* |
| 55 | Cement (661 02) | 1·4<br>*60·3* | B/L 882·7<br>*142·0* | G 623·7<br>*116·7* | F 131·6<br>*117·7* |
| 56 | Travel goods (831) | 0·6<br>*111·7* | G 1,434·0<br>*209·8* | F 125·8<br>*144·7* | N 69·4<br>*87·4* |
| 57 | Lead (685) | 1·1<br>*97·0* | B/L 1,485·0<br>*173·5* | G 705·7<br>*110·4* | F 204·5<br>*209·2* |
| 58 | Wood and cork manufactures (63) | 1·7<br>*111·9* | S 1,469·0<br>*139·8* | F 1,222·0<br>*108·9* | G 855·3<br>*240·4* |
| 59 | Watches and clocks (864) | 0·6<br>*117·5* | G 3,944·0<br>*119·9* | F 354·5<br>*84·1* | N 28·1<br>*168·1* |
| 60 | Zinc (686) | 0·7<br>*115·6* | B/L 4,062·0<br>*106·5* | G 884·9<br>*116·7* | N 401·9<br>*124·0* |

Source: *O.E.E.C. Foreign Trade Statistics*, Series IV, and *Annual Statement of the Trade of the United Kingdom*.

It is true that a marked difference in comparative-cost conditions also means greater difficulties of adjustment when trade barriers are abolished, but in my view that would be a small price to pay for the lasting benefits that would accrue to Britain from the establishment of a European free-trade area.

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# THE "CLASSICAL THEORY" OF INTERNATIONAL TRADE AND THE UNDERDEVELOPED COUNTRIES[1]

THERE has recently been a considerable amount of controversy concerning the applicability of the "classical theory" of international trade to the underdeveloped countries.[2] The twists in this controversy may be set out as follows. The critics start with the intention of showing that the "nineteenth-century pattern" of international trade, whereby the underdeveloped countries export raw materials and import manufactured goods, has been unfavourable to the economic development of these countries. But instead of trying to show this directly, they concentrate their attacks on the "classical theory," which they believe to be responsible for the unfavourable pattern of trade. The orthodox economists then come to the defence of the classical theory by reiterating the principle of comparative costs which they claim to be applicable both to the developed and the underdeveloped countries. After this, the controversy shifts from the primary question whether or not the nineteenth-century pattern of international trade, as a historical reality, has been unfavourable to the underdeveloped countries to the different question whether or not the theoretical model assumed in the comparative-costs analysis is applicable to these countries. Both sides then tend to conduct their argument as though the two questions were the same and to identify the "classical theory" with the comparative-costs theory.

It will be argued in this paper that this has led to the neglect of those other elements in the classical theory of international trade which are much nearer to the realities and ideologies of the nineteenth-century expansion of international trade to the underdeveloped countries. In Sections I and II we shall outline these elements and show that they are traceable to Adam Smith and to some extent to J. S. Mill. In Section III we shall show how one of Adam Smith's lines of approach can be fruitfully developed to throw a more illuminating light on the past and present patterns of the international trade of the underdeveloped countries than the conventional theory. In Section IV we shall touch upon some policy implications of our analysis and show certain weaknesses in the position both of the orthodox economists and of their critics.

[1] This paper has benefited from comments by Sir Donald MacDougall, Professor H. G. Johnson, R. M. Sundrum and G. M. Meier.

[2] Of the very extensive literature on the subject, we may refer to two notable recent works, the first stating the orthodox position and the second the position of the critics: J. Viner, *International Trade and Economic Development*, and G. Myrdal, *An International Economy*.

## I

The neglected elements in the classical theory of international trade may be traced to Adam Smith, particularly to the following key passage in the *Wealth of Nations*:

> "Between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out that surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return for it something else for which there is a demand. It gives a value to their superfluities, by exchanging them for something else, which may satisfy a part of their wants, and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers, and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society" (Vol. I, Cannan ed., p. 413).

There are two leading ideas here. (i) International trade overcomes the narrowness of the home market and provides an outlet for the surplus product above domestic requirements. This develops into what may be called the "vent for surplus" [1] theory of international trade. Later we hope to remove some of the prejudice aroused by this "mercantilist" sounding phrase. (ii) By widening the extent of the market, international trade also improves the division of labour and raises the general level of productivity within the country. This develops into what may be called the "productivity" theory. We shall be mainly concerned with the "vent for surplus" theory and the light it throws upon the growth of international trade in the underdeveloped countries in the nineteenth century. But first it is necessary to consider the "productivity" theory briefly.

The "productivity" doctrine differs from the comparative-costs doctrine in the interpretation of "specialisation" for international trade. (*a*) In the comparative costs theory "specialisation" merely means a movement along a static "production possibility curve" constructed on the given resources and the *given techniques* of the trading country. In contrast, the "productivity" doctrine looks upon international trade as a dynamic force which, by widening the extent of the market and the scope of the division of labour, raises the skill and dexterity of the workmen, encourages technical innova-

[1] This term is borrowed from Professor J. H. Williams, who in turn quoted it from a passage in J. S. Mill's *Principles*, in which Mill was criticising this particular aspect of Smith's theory of international trade. Professor Williams is the only modern economist to sponsor this "crude" doctrine. While he is mainly concerned with the loss to a country on being deprived of the export market for its surplus product, we shall pay special attention to the gain to a hitherto isolated underdeveloped country on obtaining a "vent" for its surplus productive capacity. Cf. J. H. Williams, "The Theory of International Trade Reconsidered," ECONOMIC JOURNAL, June 1929, pp. 195–209.

tions, overcomes technical indivisibilities and generally enables the trading country to enjoy increasing returns and economic development.[1] This distinction was clearly realised by J. S. Mill, who regarded the gains in terms of comparative-costs theory as direct gains and the gains in terms of Adam Smithian increases in productivity as "indirect effects, which must be counted as benefits of a high order." Mill even went on to extend this doctrine to countries at "an early stage of industrial advancement," where international trade by introducing new wants "sometimes works a sort of industrial revolution" (*Principles*, Ashley ed., p. 581). (*b*) In the comparative costs theory "specialisation," conceived as a reallocation of resources, is a completely reversible process. The Adam Smithian process of specialisation, however, involves adapting and reshaping the productive structure of a country to meet the export demand, and is therefore not easily reversible. This means that a country specialising for the export market is more vulnerable to changes in the terms of trade than is allowed for in the comparative-costs theory. We shall come back to this point later.

In the expansive mental climate of the late nineteenth century the "productivity" aspect of international specialisation completely dominated the "vulnerability" aspect. At a semi-popular level, and particularly in its application to the underdeveloped countries, Smith's "productivity" doctrine developed beyond a free-trade argument into an export-drive argument. It was contended that since international trade was so beneficial in raising productivity and stimulating economic development, the State should go beyond a neutral and negative policy of removing barriers to trade and embark on a positive policy of encouraging international trade and economic development. Under its influence, many colonial governments went far beyond the strict *laissez-faire* policy in their attempts to promote the export trade of the colonies.[2] Further, although these governments were frequently obliged to use "unclassical" methods, such as the granting of monopolistic privileges to the chartered companies or the taxing of the indigenous people to force them to take up wage labour or grow cash crops, they nevertheless sought to justify their policy by invoking the Adam Smithian doctrine of the benefits of international division of labour. This partly explains why some critics have associated the "classical theory" with "colonialism" and why they have frequently singled out Adam Smith for attack instead of Ricardo, the founder of the official classical free-trade theory.

It is fair to say that Smith's "productivity" doctrine is instructive more

[1] Cf. *op. cit.*, Chapters II and III, Book I. This aspect of Smith's theory has been made familiar by Professor Allyn Young's article on "Increasing Returns and Economic Progress," ECONOMIC JOURNAL, December 1928, pp. 527–42.

[2] See for instance, L. C. A. Knowles, *The Economic Development of the British Overseas Empire*, Vol. I, pp. 119–20, 248–9 and 486–7. However, in Section IV below we shall argue that, in spite of the attention they have received, these export-drive policies were not successful enough to cause a significant "export-bias."

in relation to the ideological than to the actual economic forces which characterised the nineteenth-century expansion of international trade to the underdeveloped countries. It is true, as we shall see later,[1] that both the total value and the physical output of the exports of these countries expanded rapidly. In many cases the rate of increase in export production was well above any possible rate of increase in population, resulting in a considerable rise in output per head. But it is still true to say that this was achieved not quite in the way envisaged by Smith, viz., a better division of labour and specialisation leading on to innovations and cumulative improvements in skills and productivity per man-hour. Rather, the increase in output per head seems to have been due: (i) to once-for-all increases in productivity accompanying the transfer of labour from the subsistence economy to the mines and plantations, and (ii) what is more important, as we shall see later, to an increase in working hours and in the proportion of gainfully employed labour relatively to the semi-idle labour of the subsistence economy.

The transfer of labour from the subsistence economy to the mines and plantations with their much higher capital–output ratio and skilled management undoubtedly resulted in a considerable increase in productivity. But this was mostly of a once-for-all character for a number of reasons. To begin with, the indigenous labour emerging from the subsistence economy was raw and technically backward. Moreover, it was subject to high rates of turnover, and therefore not amenable to attempts to raise productivity. Unfortunately, this initial experience gave rise to or hardened the convention of "cheap labour," which regarded indigenous labour merely as an undifferentiated mass of low-grade man-power to be used with a minimum of capital outlay.[2] Thus when the local labour supply was exhausted the typical reaction was not to try to economise labour by installing more machinery and by reorganising methods of production but to seek farther afield for additional supplies of cheap labour. This is why the nineteenth-century process of international trade in the underdeveloped countries was characterised by large-scale movements of cheap labour from India and China.[3] This tendency was reinforced by the way in which the world-market demand for raw materials expanded in a series of waves. During the booms output had to be expanded as quickly as possible along existing lines, and there was no time to introduce new techniques or reorganise production; during the slumps it was difficult to raise capital for such purposes.

[1] See footnotes on pp. 324 and 327 below. See also Sir Donald MacDougall's *The World Dollar Problem*, pp. 134–43. Sir Donald's argument that the productivity of labour in the underdeveloped countries has been rising faster than is generally assumed is mainly based on figures for productivity *per capita*. These figures are not inconsistent with our argument that on the whole the expansion of the export production has been achieved on more or less constant techniques and skills of indigenous labour, by increasing working hours and the proportion of gainfully employed labour rather than by a continuous rise in productivity per man-hour.

[2] Cf. S. H. Frankel, *Capital Investment in Africa*, pp. 142–6, and W. M. Macmillan, *Europe and West Africa*, pp. 48–50.

[3] Cf. Knowles, *op. cit.*, pp. viii and 182–201.

This failure to achieve Adam Smith's ideal of specialisation leading on to continuous improvements in skills can also be observed in the peasant export sectors. Where the export crop happened to be a traditional crop (*e.g.*, rice in South-East Asia), the expansion in export production was achieved simply by bringing more land under cultivation with the same methods of cultivation used in the subsistence economy. Even where new export crops were introduced, the essence of their success as peasant export crops was that they could be produced by fairly simple methods involving no radical departure from the traditional techniques of production employed in subsistence agriculture.[1]

Thus instead of a process of economic growth based on continuous improvements in skills, more productive recombinations of factors and increasing returns, the nineteenth-century expansion of international trade in the underdeveloped countries seems to approximate to a simpler process based on constant returns and fairly rigid combinations of factors. Such a process of expansion could continue smoothly only if it could feed on *additional* supplies of factors in the required proportions.

## II

Let us now turn to Smith's "vent for surplus" theory of international trade. It may be contrasted with the comparative-costs theory in two ways.

(*a*) The comparative-costs theory assumes that the resources of a country are given and fully employed before it enters into international trade. The function of trade is then to reallocate its given resources more efficiently between domestic and export production in the light of the new set of relative prices now open to the country. With given techniques and full employment, export production can be increased only at the cost of reducing the domestic production. In contrast, the "vent for surplus" theory assumes that a previously isolated country about to enter into international trade possesses a surplus productive capacity [2] of some sort or another. The function of trade here is not so much to reallocate the given resources as to provide the new effective demand for the output of the surplus resources which would have remained unused in the absence of trade. It follows that export production can be increased without necessarily reducing domestic production.

[1] Thus A. McPhee wrote about the palm-oil and ground-nut exports of West Africa: "They made little demand on the energy and thought of the natives and they effected no revolution in the society of West Africa. That was why they were so readily grafted on the old economy and grew as they did" (*The Economic Revolution in West Africa*, pp. 39–40). Some writers argue that there was a studied neglect of technical improvements in the peasant sector to facilitate the supply of cheap labour to other sectors. Cf., for example, W. A. Lewis, "Economic Development with Unlimited Supplies of Labour," *Manchester School*, May 1954, pp. 149–50. For a description of imperfect specialisation in economic activity in West Africa see P. T. Bauer and B. S. Yamey, "Economic Progress and Occupational Distribution," ECONOMIC JOURNAL, December 1951, p. 743.

[2] A surplus over domestic requirements and *not* a surplus of exports over imports.

(*b*) The concept of a surplus productive capacity above the requirements of domestic consumption implies an inelastic domestic demand for the exportable commodity and/or a considerable degree of internal immobility and specificness of resources. In contrast, the comparative-costs theory assumes either a perfect or, at least, a much greater degree of internal mobility of factors and/or a greater degree of flexibility or elasticity both on the side of production and of consumption. Thus the resources not required for export production will not remain as a surplus productive capacity, but will be reabsorbed into domestic production, although this might take some time and entail a loss to the country.

These two points bring out clearly a peculiarity of the "vent-for-surplus" theory which may be used either as a free-trade argument or as an anti-trade argument, depending on the point of view adopted. (*a*) From the point of view of a previously isolated country, about to enter into trade, a surplus productive capacity suitable for the export market appears as a virtually "costless" means of acquiring imports and expanding domestic economic activity. This was how Adam Smith used it as a free-trade argument. (*b*) From the point of view of an established trading country faced with a fluctuating world market, a sizeable surplus productive capacity which cannot be easily switched from export to domestic production makes it "vulnerable" to external economic disturbances. This is in fact how the present-day writers on the underdeveloped countries use the same situation depicted by Smith's theory as a criticism of the nineteenth-century pattern of international trade. This concept of vulnerability may be distinguished from that which we have come across in discussing the "productivity" theory of trade. There, a country is considered "vulnerable" because it has adapted and reshaped its productive structure to meet the requirements of the export market through a genuine process of "specialisation." Here, the country is considered "vulnerable" simply because it happens to possess a sizeable surplus productive capacity which (even without any improvements and extensions) it cannot use for domestic production. This distinction may be blurred in border-line cases, particularly in underdeveloped countries with a large mining sector. But we hope to show that, on the whole, while the "vulnerability" of the advanced countries, such as those in Western Europe which have succeeded in building up large export trades to maintain their large populations, is of the first kind, the "vulnerability" of most of the underdeveloped countries is of the second kind.

Let us now consider the "vent-for-surplus" approach purely as a theoretical tool. There is a considerable amount of prejudice among economists against the "vent-for-surplus" theory, partly because of its technical crudeness and partly because of its mercantilist associations. This may be traced to J. S. Mill, who regarded Smith's "vent-for-surplus" doctrine as "a surviving relic of the Mercantile Theory" (*Principles*, p. 579).

The crux of the matter here is the question: why should a country isolated from international trade have a surplus productive capacity? The answer which suggests itself is that, given its random combination of natural resources, techniques of production, tastes and population, such an isolated country is bound to suffer from a certain imbalance or disproportion between its productive and consumption capacities. Thus, take the case of a country which starts with a sparse population in relation to its natural resources. This was broadly true not only of Western countries during their mercantilist period but also of the underdeveloped countries of South-East Asia, Latin America and Africa when they were opened up to international trade in the nineteenth century. Given this situation, the conventional international-trade theory (in its Ohlin version) would say that this initial disproportion between land and labour would have been equilibrated away by appropriate price adjustments: *i.e.*, rents would be low and relatively land-using commodities would have low prices, whereas wages would be high and relatively labour-using commodities would have high prices. In equilibrium there would be no surplus productive capacity (although there might be surplus land by itself) because the scarce factor, labour, would have been fully employed. Thus when this country enters into international trade it can produce the exports only by drawing labour away from domestic production. Now this result is obtained only by introducing a highly developed price mechanism and economic organisation into a country which is supposed to have had no previous economic contacts with the outside world. This procedure may be instructive while dealing with the isolated economy as a theoretical model. But it is misleading when we are dealing with genuinely isolated economies in their proper historical setting; it is misleading, in particular, when we are dealing with the underdeveloped countries, many of which were subsistence economies when they were opened to international trade. In fact, it was the growth of international trade itself which introduced or extended the money economy in these countries. Given the genuine historical setting of an isolated economy, might not its initial disproportion between its resources, techniques, tastes and population show itself in the form of surplus productive capacity?

Adam Smith himself thought that the pre-existence of a surplus productive capacity in an isolated economy was such a matter of common observation that he assumed it implicitly without elaborating upon it. But he did give some hints suggesting how the "narrowness of the home market," which causes the surplus capacity, is bound up with the underdeveloped economic organisation of an isolated country, particularly the lack of a good internal transport system and of suitable investment opportunities.[1] Further his concept of surplus productive capacity is not merely a matter of surplus land by itself but surplus land combined with surplus labour; and the

[1] *Op. cit.*, Vol. I, pp. 21 and 383. This is similar to what Mrs. J. Robinson has described as "primitive stagnation." Cf. *The Accumulation of Capital*, pp. 256–8.

surplus labour is then linked up with his concept of " unproductive " labour. To avoid confusion, this latter should not be identified with the modern concept of " disguised unemployment " caused by an acute shortage of land in overpopulated countries. Although Smith described some cases of genuine " disguised unemployment " in the modern sense, particularly with reference to China, " unproductive " labour in his sense can arise even in thinly populated countries, provided their internal economic organisation is sufficiently underdeveloped. In fact, it is especially in relation to those underdeveloped countries which started off with sparse populations in relation to their natural resources that we shall find Smith's " vent-for-surplus " approach very illuminating.

## III

Let us now try to relate the " vent-for-surplus " theory to the nineteenth-century process of expansion of international trade to the underdeveloped countries. Even from the somewhat meagre historical information about these countries, two broad features stand out very clearly. First the underdeveloped countries of South-East Asia, Latin America and Africa, which were to develop into important export economies, started off with sparse populations relatively to their natural resources. If North America and Australia could then be described as " empty," these countries were at least " semi-empty." Secondly, once the opening-up process had got into its stride, the export production of these countries expanded very rapidly, along a typical growth curve,[1] rising very sharply to begin with and tapering off afterwards. By the Great Depression of the 1930s, the expansion process seems to have come to a stop in many countries; in others, which had a later start, the expansion process may still be continuing after the Second World War.

There are three reasons why the " vent-for-surplus " theory offers a more effective approach than the conventional theory to this type of expansion of international trade in the underdeveloped countries.

(i) The characteristically high rates of expansion which can be observed in the export production of many underdeveloped countries cannot really be explained in terms of the comparative-costs theory based on the assumption of given resources and given techniques. Nor can we attribute any significant part of the expansion to revolutionary changes in techniques and increases in productivity. As we have seen in Section I, peasant export

[1] For instance, the annual value of Burma's exports, taking years of high and low prices, increased at a constant proportional rate of 5% per annum on the average between 1870 and 1900. Similar rates of expansion can be observed for Siam and Indonesia (Cf. J. S. Furnivall, *Colonial Policy and Practice*, Appendix I; J. H. Boeke, *The Structure of Netherlands Indian Economy*, p. 184; and J. C. Ingram, *Economic Change in Thailand since 1850*, Appendix C). African export economies started their expansion phase after 1900, and the official trade returns for the Gold Coast, Nigeria and Uganda show similar rates of increase after that date, although the expansion process was arrested by the depression of the 1930s.

production expanded by extension of cultivation using traditional methods of production, while mining and plantation sectors expanded on the basis of increasing supplies of cheap labour with a minimum of capital outlay. Thus the contributions of Western enterprise to the expansion process are mainly to be found in two spheres: the improvements of transport and communications [1] and the discoveries of new mineral resources. Both are methods of increasing the total volume of resources rather than methods of making the given volume of resources more productive. All these factors suggest an expansion process which kept itself going by drawing an increasing volume of hitherto unused or surplus resources into export production.

(ii) International trade between the tropical underdeveloped countries and the advanced countries of the temperate zone has grown out of sharp differences in geography and climate resulting in absolute differences of costs. In this context, the older comparative-costs theory, which is usually formulated in terms of qualitative differences [2] in the resources of the trading countries, tends to stress the obvious geographical differences to the neglect of the more interesting quantitative differences in the factor endowments of countries possessing approximately the same type of climate and geography. Thus while it is true enough to say that Burma is an exporter of rice because of her climate and geography, the more interesting question is why Burma should develop into a major rice exporter while the neighbouring South India, with approximately the same type of climate and geography, should develop into a net importer of rice. Here the "vent-for-surplus" approach which directs our attention to population density as a major determinant of export capacity has an advantage over the conventional theory.[3]

(iii) Granted the importance of quantitative differences in factor endowments, there still remains the question why Smith's cruder "vent-for-surplus" approach should be preferable to the modern Ohlin variant of the comparative-costs theory. The main reason is that, according to the Ohlin theory, a country about to enter into international trade is supposed already to possess a highly developed and flexible economic system which can adjust its methods of production and factor combinations to cope with a wide range of possible variations in relative factor supplies (see Section II above). But in fact the economic framework of the underdeveloped countries is a

[1] This is what Professor L. C. A. Knowles described as the "Unlocking of the Tropics" (*op. cit.*, pp. 138–52).

[2] Cf. J. Viner, *International Trade and Economic Development*, pp. 14–16.

[3] Those who are used to handling the problem in terms of qualitative differences in factors and differential rent may ask: why not treat the surplus productive capacity as an extreme instance of "differential rent" where the transfer cost of the factors from the domestic to export production is zero? But this does not accurately portray the situation here. The transfer cost of the factors is zero, not because land which is used for the export crop is not at all usable for domestic subsistence production but because with the sparse population in the early phase there is no demand for the surplus food which could have been produced on the land used for the export crop. As we shall see, at a later stage when population pressure begins to grow, as in Java, land which has been used for export is encroached upon by subsistence production.

much cruder apparatus which can make only rough-and-ready adjustments. In particular, with their meagre technical and capital resources, the underdeveloped countries operate under conditions nearer to those of fixed technical coefficients than of variable technical coefficients. Nor can they make important adjustments through changes in the outputs of different commodities requiring different proportions of factors because of the inelastic demand both for their domestic production, mainly consisting of basic foodstuff, and for their exportable commodities, mainly consisting of industrial raw materials. Here again the cruder "vent-for-surplus" approach turns out to be more suitable.

Our argument that, in general, the "vent-for-surplus" theory provides a more effective approach than the comparative-costs theory to the international trade of the underdeveloped countries does not mean that the "vent-for-surplus" theory will provide an exact fit to all the particular patterns of development in different types of export economies. No simple theoretical approach can be expected to do this. Thus if we interpret the concept of the surplus productive capacity strictly as pre-existing surplus productive capacity arising out of the original endowments of the factors, it needs to be qualified, especially in relation to the mining and plantation sectors of the underdeveloped countries. Here the surplus productive capacity which may have existed to some extent before the country was opened to international trade is usually greatly increased by the discovery of new mineral resources and by a considerable inflow of foreign capital and immigrant labour. While immigrant labour is the surplus population of other underdeveloped countries, notably India and China, the term "surplus" in the strict sense cannot be applied to foreign capital. But, of course, the existence of suitable surplus natural resources in an underdeveloped country is a pre-condition of attracting foreign investment into it. Two points may be noted here. First, the complication of foreign investment is not as damaging to the surplus-productive-capacity approach as it appears at first sight, because the inflow of foreign investment into the tropical and semi-tropical underdeveloped countries has been relatively small both in the nineteenth century and the inter-war period.[1] Second, the nineteenth-century phenomenon of international mobility of capital and labour has been largely neglected by the comparative-costs theory, which is based on the assumption of perfect mobility of factors within a country and their imperfect mobility between different countries. The surplus-productive-capacity approach at least serves to remind us that the output of mining and plantation sectors can expand without necessarily contracting domestic subsistence output.

The use of the surplus-productive-capacity approach may prove in particular to be extremely treacherous in relation to certain parts of Africa,

[1] Cf. R. Nurkse, "International Investment To-day in the Light of Nineteenth Century Experience," ECONOMIC JOURNAL, December 1954, pp. 744–58, and the United Nations Report on *International Capital Movements during the Inter-war Period.*

where mines, plantations and other European enterprises have taken away from the tribal economies the so-called "surplus" land and labour, which, on a closer analysis, prove to be no surplus at all. Here the extraction of these so-called "surplus" resources, by various forcible methods in which normal economic incentives play only a part, entails not merely a reduction in the subsistence output but also much heavier social costs in the form of the disruption of the tribal societies.[1]

When we turn to the peasant export sectors, however, the application of the "vent-for-surplus" theory is fairly straightforward. Here, unlike the mining and plantation sectors, there has not been a significant inflow of foreign investment and immigrant labour. The main function of the foreign export–import firms has been to act as middlemen between the world market and the peasants, and perhaps also to stimulate the peasants' wants for the new imported consumers' goods. As we have seen, peasant export production expanded by using methods of production more or less on the same technical level as those employed in the traditional subsistence culture. Thus the main effect of the innovations, such as improvements in transport and communications [2] and the introduction of the new crops, was to bring a greater area of surplus land under cultivation rather than to raise the physical productivity per unit of land and labour. Yet peasant export production usually managed to expand as rapidly as that of the other sectors while remaining self-sufficient with respect to basic food crops. Here, then, we have a fairly close approximation to the concept of a pre-existing surplus productive capacity which can be tapped by the world-market demand with a minimum addition of external resources.

Even here, of course, there is room for differences in interpretation. For instance, there is evidence to suggest that, in the early decades of expansion, the rates of increase in peasant export production in South-East Asian and West African countries were well above the possible rates of growth in their working population.[3] Given the conditions of constant techniques, no significant inflow of immigrant foreign labour and continuing self-sufficiency with respect to the basic food crops, we are left with the question how these peasant economies managed to obtain the extra labour required to

[1] Cf. The United Nations Report on the *Enlargement of the Exchange Economy in Tropical Africa*, pp. 37 and 49–51.

[2] It may be noted that the expansion of some peasant export crops, notably rice in South-East Asia, depended to a much greater extent on pre-existing indigenous transport facilities, such as river boats and bullock carts, than is generally realised.

[3] For instance, cocoa output of the Gold Coast expanded over forty times during the twenty-five year period 1905–30. Even higher rates of expansion in cocoa production can be observed in Nigeria combined with a considerable expansion in the output of other export crops. Both have managed to remain self-sufficient with regard to basic food crops (cf. West African Institute of Economic Research, *Annual Conference*, Economic Section, Achimota, 1953, especially the chart between pp. 96 and 98; *The Native Economies of Nigeria*, ed. M. Perham, Vol. I, Part II). In Lower Burma, for the thirty-year period 1870–1900, the area under rice cultivation increased by more than three times, while the population, including immigrants from Upper Burma, doubled. (Cf. also, Furnivall, *op. cit.*, pp. 84–5.)

expand their export production so rapidly. A part of this labour may have been released by the decline in cottage industries and by the introduction of modern labour-saving forms of transport in place of porterage, but the gap in the explanation cannot be satisfactorily filled until we postulate that even those peasant economies which started off with abundant land relatively to their population must have had initially a considerable amount of under-employed or surplus labour. This surplus labour existed, not because of a shortage of co-operating factors, but because in the subsistence economies, with poor transport and little specialisation in production, each self-sufficient economic unit could not find any market outlet to dispose of its potential surplus output, and had therefore no incentive to produce more than its own requirements. Here, then, we have the archetypal form of Smith's "unproductive" labour locked up in a semi-idle state in the underdeveloped economy of a country isolated from outside economic contacts. In most peasant economies this surplus labour was mobilised, however, not by the spread of the money-wage system of employment, but by peasant economic units with their complement of "family" labour moving *en bloc* into the money economy and export production.

The need to postulate a surplus productive capacity to explain the rapid expansion in peasant export production is further strengthened when we reflect on the implications of the fact that this expansion process is inextricably bound up with the introduction of the money economy into the subsistence sectors. To the peasant on the threshold of international trade, the question whether or not to take up export production was not merely a question of growing a different type of crop but a far-reaching decision to step into the new and unfamiliar ways of the money economy.

Thus let us consider a community of self-sufficient peasants who, with their existing techniques, have just sufficient land and labour to produce their minimum subsistence requirements, so that any export production can be achieved only by reducing the subsistence output below the minimum level. Now, according to the conventional economic theory, there is no reason why these peasants should not turn to export production if they have a differential advantage there, so that they could more than make up for their food deficit by purchases out of their cash income from the export crop. But, in practice, the peasants in this situation are unlikely to turn to export production so readily. Nor is this "conservatism" entirely irrational, for by taking up export production on such a slender margin of reserves, the peasants would be facing the risk of a possible food shortage for the sake of some gain in the form of imported consumers' goods which are "luxuries" to them. Moreover, this gain might be wiped off by unfavourable changes in the prices of both the export crop they would sell and the food-stuffs they would have to buy and by the market imperfections, which would be considerable at this early stage. Thus, where the margin of resources is very small above that required for the minimum subsistence output, we

should expect the spread of export production to be inhibited or very slow, even if there were some genuine possibilities of gains on the comparative costs principle.[1]

In contrast, the transition from subsistence agriculture to export production is made much easier when we assume that our peasants start with some surplus resources which enable them to produce the export crop *in addition* to their subsistence production. Here the surplus resources perform two functions: first they enable the peasants to hedge their position completely and secure their subsistence minimum before entering into the risks of trading; and secondly, they enable them to look upon the imported goods they obtain from trade in the nature of a clear net gain obtainable merely for the effort of the extra labour in growing the export crop. Both of these considerations are important in giving the peasants just that extra push to facilitate their first plunge into the money economy.

Starting from this first group of peasants, we may picture the growth of export production and the money economy taking place in two ways. Firstly, the money economy may grow extensively, with improvements in transport and communications and law and order, bringing in more and more groups of peasants with their complements of family labour into export production on the same "part-time" basis as the first group of peasants. Secondly, the money economy may grow intensively by turning the first group of peasants from "part-time" into "whole-time" producers of the export crop.[2] In the first case, surplus resources are necessary as a lubricant to push more peasants into export production at each round of the widening circle of the money economy. Even in the second case, surplus resources are necessary if the whole-time export producers buy their food requirements locally from other peasants, who must then have surplus resources to produce the food crops above their own requirements. Logically, there is no reason why the first group of peasants who are now whole-time producers of the

[1] Of course, this argument can be countered by assuming the differences in comparative costs to be very wide. But, so long as export production requires withdrawing some resources from subsistence production, some risks are unavoidable. Further, remembering that the middlemen also require high profit margins at this stage, the gains large enough to overcome the obstacles are likely to arise out of surplus resources rather than from the differential advantages of the given fully employed resources. The risk of crop-failure is, of course, present both in subsistence and export production.

[2] In either case the expansion process may be looked upon as proceeding under conditions approximating to constant techniques and fixed combinations between land and labour once equilibrium is reached. The distinctive feature of peasant export economies is their failure to develop new and larger-scale or extensive methods of farming. It is true that in subsistence agriculture "fixed factors," such as a plough and a pair of bullocks, were frequently used below capacity, and one important effect of cash production was to increase the size of the holding to the full capacity of these "fixed factors." But this may be properly looked upon as equilibrium adjustments to make full use of surplus capacity rather than as the adoption of new and more land-using methods of production. Increasing the size of holding to make a more effective use of a pair of bullocks is different from the introduction of a tractor! Our assumption of constant techniques does not preclude the development of large-scale ownership of land as distinct from large-scale farming.

export crop should buy their food requirements locally instead of importing them. But, as it happens, few peasant export economies have specialised in export production to such an extent as to import their basic food requirements.

The average economist's reaction to our picture of discrete blocks of surplus productive capacity being drawn into a widening circle of money economy and international trade is to say that while this "crude" analysis may be good enough for the transition phase, the conventional analysis in terms of differential advantages and continuous marginal productivity curves must come into its own once the transition phase is over. Here it is necessary to distinguish between the expansion phase and the transition phase. It is true that in most peasant export economies the expansion process is tapering off or has come to a stop, as most of the surplus land suitable for the export crop has been brought under cultivation. This, of course, brings back the problem of allocating a fixed amount of resources, as we shall see in the next section when we consider issues of economic policy. But even so, the surplus-productive-capacity approach is not entirely superseded so long as the transition from a subsistence to a fully developed money economy remains incomplete. In most underdeveloped countries of Asia and Africa [1] this transition seems not likely to be over until they cease to be underdeveloped.

The continuing relevance of the surplus-productive-capacity approach may be most clearly seen in the typical case of a peasant export economy which with its natural resources and methods of production has reached the limit of expansion in production while its population continues to grow rapidly. According to the surplus-productive-capacity approach, we should expect the export capacity of such a country to fall roughly in proportion as the domestic requirement of resources to feed a larger population increases. This common-sense result may, however, be contrasted with that obtainable from the conventional theory as formulated by Ohlin. First, it appears that the Ohlin theory puts to the forefront of the picture the *type* of export, *i.e.*, whether it is more labour-using or land-using as distinct from the total export capacity measured by the ratio of total exports to the total national output of the trading country. Secondly, in the Ohlin theory there is no reason why a thickly populated country should not also possess a high ratio of (labour-intensive) exports to its total output.

The ideal pattern of trade suggested by the Ohlin theory has a real counterpart in the thickly populated advanced countries of Europe, which for that very reason are obliged to build up a large export trade in manufactures or even in agriculture as in the case of Holland. But when we turn to the thickly populated underdeveloped countries, however, the ideal

[1] Cf. the United Nations Report cited above on the *Enlargement of the Exchange Economy*. Even in the most developed peasant export economies the money economy has not spread to the same extent in the market for factors of production as in the market for products.

and the actual patterns of international trade diverge widely from each other. Indeed, we may say that these countries remain underdeveloped precisely because they have not succeeded in building up a labour-intensive export trade to cope with their growing population. The ratio of their export to total production could, of course, be maintained at the same level and the pressure of population met in some other way. But given the existing conditions, even this neutral pattern may not be possible in many underdeveloped countries. Thus, in Indonesia there is some evidence to suggest that the volume of agricultural exports from the thickly populated Java and Madura is declining absolutely and also relatively to those of the Outer Islands, which are still sparsely populated.[1] Of course, there are other causes of this decline, but population pressure reducing the surplus productive capacity of Java seems to be a fundamental economic factor; and the decline spreads from peasant to plantation exports as more of the plantation lands, which were under sugar and rubber, are encroached upon by the peasants for subsistence production.[2] In general, given the social and economic conditions prevailing in many underdeveloped countries, it seems fair to conclude that the trend in their export trade is likely to be nearer to that suggested by the surplus-productive-capacity approach than to that suggested by the theory of comparative costs.[3]

## IV

This paper is mainly concerned with interpretation and analysis, but we may round off our argument by touching briefly upon some of its policy implications.

(i) We have seen that the effect of population pressure on many underdeveloped countries, given their existing social and economic organisation, is likely to reduce their export capacity by diverting natural resources from export to subsistence production. If we assume that these natural resources have a genuine differential advantage in export production, then population pressure inflicts a double loss: first, through simple diminishing returns, and secondly, by diverting resources from more to less productive use.

[1] Cf. J. H. Boeke, *Ontwikkelingsgang en toekomst van bevolkings-en ondernemingslandbouw in Nederlandsch-Indie* (Leiden, 1948), p. 91. I owe this reference to an unpublished thesis by Mr. M. Kidron.

[2] The same tendency to transfer land from plantation to subsistence agriculture may be observed in Fiji with the growing population pressure created by the Indian immigrant labour originally introduced to work in the sugar plantations. The outline is blurred here by the decline in the sugar industry. The reason why this tendency does not seem to operate in the West Indies is complex. But it may be partly attributable to the tourist industry, which helps to pay for the food imports of some of the islands.

[3] The surplus-productive-capacity approach also partly helps to explain why underdeveloped countries, such as India, which started off with a thick population tend to retain large and persistent pockets of subsistence sectors in spite of their longer contacts with the world economy, while the subsistence sectors in thinly populated countries, such as those in West Africa, tend to disappear at a faster rate in spite of their much later start in international trade.

Thus, if Java has a genuine differential advantage in growing rubber and sugar, she would obtain a greater amount of rice by maintaining her plantation estates instead of allowing them to be encroached upon by peasants for subsistence rice cultivation. The orthodox liberal economists, confronted with this situation, would, of course, strongly urge the removal of artificial obstacles to a more systematic development of the money economy and the price system. Now there are still many underdeveloped countries which are suffering acutely from the economic rigidities arising out of their traditional social structure and/or from discriminatory policies based on differences in race, religion and class. Here the removal of barriers, for instance, to the horizontal and vertical mobility of labour, freedom to own land and to enter any occupation, etc., may well prove to be a great liberating force.[1] But our analysis has suggested that it is much easier to promote the growth of the money economy in the early stage when a country is newly opened up to international trade and still has plenty of surplus land and labour rather than at a later stage, when there are no more surplus resources, particularly land, to feed the growth of the money economy. Thus in a country like Java there is a considerable amount of artificial restriction, customary or newly introduced, which the liberal economists can criticise, *e.g.*, restriction on land ownership. But given the combination of population pressure, large pockets of subsistence economy and traditional methods of production which can no longer be made more labour-intensive, it seems very doubtful whether the mere removal of artificial restrictions can do much by itself without a more vigorous policy of state interference. The truth of the matter is that in the underdeveloped countries where, for various reasons described above, the exchange economy is still an extremely crude and imperfect apparatus which can make only rough-and-ready responses to economic differentials, it may require a considerable amount of state interference to move toward the comparative-costs equilibrium. Thus given that Java has genuine differential advantages in the production of rubber and sugar, a more optimal reallocation of her resources may require, for instance, the removal of her surplus population either to the thinly populated Outer Islands or to industries within Java and a vigorous export-drive policy supplemented by bulk purchase and subsidies on the imported rice. Here we come to a fundamental dilemma which is particularly acute for the orthodox liberal economists. On a closer examination it turns out that their free-trade argument, although ostensibly based on the comparative-costs principle, is buttressed by certain broad classical presumptions against protection and state interference:[2] *e.g.*, the difficulty of selecting the right

[1] This is why the case for the "liberal" solution is strong in places such as East and Central Africa, where due both to the general backwardness of the indigenous population and the presence of a white settler population, both types of rigidity prevail (cf. *The Royal Commission Report on East Africa*).

[2] Cf. J. Viner, *International Trade and Economic Development*, pp. 41–2. See also Sidgwick, *Principles of Political Economy*, Book III, Chapter V.

industry to protect, the virtual impossibility of withdrawing protection once given, the tendency of controls to spread promiscuously throughout the economic system strangling growth, and so on. These presumptions gain an added strength from the well-known administrative inefficiency and sometimes corruption of the governments of some underdeveloped countries. Thus even if we believe in the "nineteenth-century pattern" of international trade based on natural advantages, how can we be sure that the state is competent enough to select the right commodities for its export-drive policy when it is considered incompetent to select the right industry for protection?

(ii) We have seen that the rapid expansion in the export production of the underdeveloped countries in the nineteenth century cannot be satisfactorily explained without postulating that these countries started off with a considerable amount of surplus productive capacity consisting both of unused natural resources and under-employed labour. This gives us a common-sense argument for free trade which is especially relevant for the underdeveloped countries in the nineteenth century: the surplus productive capacity provided these countries with a virtually "costless" means of acquiring imports which did not require a withdrawal of resources from domestic production but merely a fuller employment for their semi-idle labour. Of course, one may point to the real cost incurred by the indigenous peoples in the form of extra effort and sacrifice of the traditional leisurely life [1] and also to the various social costs not normally considered in the comparative-costs theory, such as being sometimes subject to the pressure of taxation and even compulsory labour and frequently of having to accommodate a considerable inflow of immigrant labour creating difficult social and political problems later on. One may also point to a different type of cost which arises with the wasteful exploitation of natural resources.[2] But for the most part it is still true to say that the indigenous peoples of the underdeveloped countries took to export production on a voluntary basis and enjoyed a clear gain by being able to satisfy their developing wants for the new imported commodities. Thus our special argument for free trade in this particular context still remains largely intact. The orthodox economists, by rigidly insisting on applying the comparative-costs theory to the underdeveloped countries in the nineteenth century, have therefore missed this simpler and more powerful argument.

[1] It may be formally possible to subsume the surplus-productive-capacity approach under the opportunity-cost theory, by treating leisure instead of foregone output as the main element of cost. But this would obscure the important fact that the underdeveloped countries have been able to expand their production very rapidly, not merely because the indigenous peoples were willing to sacrifice leisure but also because there were also surplus natural resources to work upon.

[2] The social cost of soil erosion can be very great, but this may be caused not merely by an expansion of export production but also by bad methods of cultivation and population pressure. The problem of adequately compensating the underdeveloped countries for the exploitation of their non-replaceable mineral resources belongs to the problem of the distribution of gains from trade. Here we are merely concerned with establishing that the indigenous peoples do obtain some gains from trade.

(iii) We have seen in Section I that the deep-rooted hostility of the critics towards the "classical theory" and the nineteenth-century pattern of international trade may be partly traced back to the time when Western colonial powers attempted to introduce export-drive policies in the tropical underdeveloped countries; and tried to justify these policies by invoking the "classical theory" of free trade and the Adam Smithian doctrine of international trade as a dynamic force generating a great upward surge in the general level of productivity of the trading countries. To the critics, this appears as a thinly disguised rationalisation of the advanced countries' desire for the markets for their manufactured products and for raw materials. Thus it has become a standard argument with the critics to say that the nineteenth-century process of international trade has introduced a large "export bias" into the economic structure of the underdeveloped countries which has increased their "vulnerability" to international economic fluctuations.

In Section II we have seen that once we leave the ideal world of the comparative costs theory in which the resources not required for the export market can be re-absorbed into domestic production, every country with a substantial export trade may be considered "vulnerable." Thus a country may be said to be vulnerable because it has built up a large ratio of export to its total production simply by making use of its pre-existing surplus productive capacity. *A fortiori*, it is vulnerable when it has genuinely improved upon its original surplus productive capacity. How does the idea of "export bias" fit into our picture?

The term "export bias" presumably means that the resources of the underdeveloped countries which could have been used for domestic production have been effectively diverted into export production by deliberate policy. The implication of our surplus-productive-capacity approach is to discount this notion of "export bias." In the peasant export sectors, at the early stage with sparse populations and plenty of surplus land, the real choice was not so much between using the resources for export production or for domestic production as between giving employment to the surplus resources in export production or leaving them idle. In the later stage, when the population pressure begins to increase as in the case of Java, we have seen that the bias is likely to develop against, rather than in favour of, the export sector. Even when we turn to the mining and plantation sectors, it is difficult to establish a significant "export bias" in the strict sense. Here the crucial question is: how far would it have been possible to divert the foreign capital and technical resources which have gone into these sectors into the domestic sector? The answer is clear. For a variety of reasons, notably the smallness of domestic markets, few governments of the underdeveloped countries, whether colonial or independent, have so far succeeded in attracting a significant amount of foreign investment away from the extractive export industries to the domestic industries. In criticising the

colonial governments it should be remembered that the only choice open to them was whether to attract a greater or a smaller amount of foreign investment within the export sector and not whether to attract investment for the domestic or the export sector.

This is not to deny that the colonial governments had a strong motive for promoting export production. Apart from the interests of the mother country, the individual colonial governments themselves had a vested interest in the expansion of foreign trade because they derived the bulk of their revenues from it.[1] In their search for revenue they have pursued various policies designed to attract foreign investment to the mining and plantation sectors, such as granting favourable concessions and leases, favourable tariff rates for rail transport, taxation policy designed to facilitate the supply of labour, provision of various technical services, etc.[2] But on the whole it is still true to say that the most important contribution of the colonial governments towards the expansion of the colonial exports is to be found, not in these export-drive policies, but in their basic services, such as the establishment of law and order and the introduction of modern transport, which enabled the pre-existing surplus productive capacity of the colonies to be tapped by the world market demand. If we wish to criticise the export-drive policies of the colonial governments it would be more appropriate to do so, not on the ground of "export bias" but on the ground that they may have diverted too great a share of the gains from international trade and of the public services of the colonies to the foreign-owned mines and plantations at the expense of indigenous labour and peasant export producers.

It may be argued that we have given too strict an interpretation of the "export-bias" doctrine which is merely meant to convey the general proposition that, whatever the exact cause, the nineteenth-century process of international trade has landed many underdeveloped countries with a large ratio of raw materials exports to their total national products, making it desirable to reduce their "vulnerability" to international economic fluctuations. But the trouble is that the "export bias" doctrine tends to suggest that the raw-materials export production of the underdeveloped countries has been artificially over-expanded, not merely in relation to their domestic sector, but absolutely. Given the strong feelings of economic nationalism and anti-colonialism in the underdeveloped countries, this can be a very mischievous doctrine strengthening the widespread belief that to go on producing raw materials for the export market is tantamount to preserving the "colonial" pattern of trade. Thus already many underdeveloped countries are giving too little encouragement to their peasant

[1] This is true for the governments of most underdeveloped countries, whether colonial or independent, past or present.

[2] For a discussion of the question of the possible export bias through the operation of the 100% sterling exchange system of the colonies, see A. D. Hazlewood, "Economics of Colonial Monetary Arrangements," *Social and Economic Studies*, Jamaica, December 1954.

export sectors by diverting too much of their capital and technical resources to industrial-development projects, and are also crippling their mining and plantation export sectors by actual or threatened nationalisation and various restrictions and regulations. The effect is to reduce their foreign-exchange earnings so urgently needed for their economic development. Of course, no competent critic of the nineteenth-century pattern of international trade would ever suggest the drastic step of reducing exports absolutely; some would even concede the need for vigorous export drive policies.[1] But having built up a pervasive feeling of hostility and suspicion against the " nineteenth-century " or the " colonial " pattern of international trade, they are not in a position to ram home the obvious truths: (*a*) that, even on an optimistic estimate of the possibilities of international aid, the underdeveloped countries will have to pay for the larger part of the cost of their economic plans aiming either at a greater national self-sufficiency or at the export of manufactured goods; (*b*) that the necessary foreign exchange for these development plans can be earned by the underdeveloped countries at the present moment only by the export of raw materials (though not necessarily the same commodities for which they were supposed to have a differential advantage in the nineteenth century); and (*c*) that therefore to pursue their development plans successfully it is vitally important for them to carry out the " export-drive " policies, which in their technical properties may not be very different from those of the colonial governments in the past.[2] In trying to carry out their development plans on the foreign-exchange earnings from raw-materials export they would, of course, still be " vulnerable "; but this should be considered separately as a problem in short-term economic stability[3] and not as a criticism of the nineteenth-century pattern of international trade in relation to the long-term development of the underdeveloped countries. From a long-term point of view, even countries which have successfully industrialised themselves and are therefore able to maintain their population at a higher standard of living by building up a large export trade in manufactures, such as Japan or the

[1] Cf., for example, Gunnar Myrdal, *An International Economy*, p. 274.

[2] Colonial governments have frequently defended their export-drive policies as the means of taxing foreign trade to finance services needed for internal development. But because they were colonial governments, their motives were suspect. At first sight we might imagine that the new independent governments of the underdeveloped countries would be free from this disability. But unfortunately, given the atmosphere of intense nationalism and anti-colonialism, this is not true. In some cases the hands of the newly independent governments seem to be tied even more tightly, and economic policies admitted to be desirable are turned down as " politically impossible." Here those economists who regard themselves as the critics of the classical theory and the nineteenth-century pattern of international trade have a special responsibility. Instead of dealing tenderly with the " understandable " emotional reactions which they have partly helped to create, they ought to be emphatic in pointing out the conflicts between rational considerations and " understandable " mental attitudes. The underdeveloped countries are too poor to enjoy the luxury of harbouring their emotional resentments.

[3] Cf. the United Nations Report on *Measures for International Economic Stability* and Myrdal's comments on it, *op. cit.*, pp. 238–53.

thickly populated countries of Western Europe, will continue to be "vulnerable." [1]

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[1] It is particularly in relation to the thickly populated advanced countries of Western Europe which have specialised and adapted their economic structure to the requirements of the export market that Professor J. H. Williams found Adam Smith's "vent-for-surplus" approach illuminating. We have, in this paper, interpreted the "surplus" more strictly in its pre-existing form without the improvements and augmentation in productive capacity due to genuine "specialisation." (Cf. J. H. Williams, "International Trade Theory and Policy—Some Current Issues," *American Economic Review, Papers and Proceedings*, 1951, pp. 426–7.)

# A NOTE ON THE ECONOMICS OF NATIONAL SUPERANNUATION

1. THIS article is written in the light of the recent discussion of the desirability and possibility of making more adequate provision for retirement incomes for the portions of the working population not at present included in private superannuation schemes; and especially with reference to the Labour Party's plan "National Superannuation. Labour's Policy for Security in Old Age" (1957). It will concentrate attention on the macro-economics of any national scheme; thus it will deal with total and average incomes, to the exclusion of any consideration of the equity or expediency of the redistributive aspects of such a scheme.

2. In order to bring out clearly the basic economic facts behind a national superannuation scheme, it has been found necessary to make certain simplifying assumptions. First, it has been assumed that a national scheme would include all the population; this is done because of the absence of either life tables or population forecasts for the members of private schemes and the rest of the population taken separately. The second simplifying assumption is that all calculations of contributions and benefits have been made in units equal to one year's average personal income. Calculations have been made on various possible assumptions to determine the contributions necessary to provide two types of benefit: first, of retirement incomes equal to 50% of the average personal income of those in the contributing age-groups; and second, of lump-sum benefits, payable on death, equal to one year's average personal income. The calculations concerning the cost of lump-sum benefits are intended to relate not to national life-insurance (which nobody has yet proposed, though it might make a good election gambit) but to the cost to the social-security system of providing benefits such as orphans' allowances following the death of the parents. Larger or smaller pensions or lump-sum benefits would require proportionately larger or smaller contributions.

3. The calculations are based on three methods. The first section deals with the actuarial approach, by which pensions and lump-sum benefits are fully paid for out of a fund built up in advance by premiums. The question of how the payment of premiums is allocated between individuals, their employers and the Exchequer is not discussed here. The second section takes the opposite extreme, the assessment approach, under which current benefits are paid for out of current contributions, and no funds are built up. The third section deals with an intermediate approach, where contributions are paid into a fund which, although not actuarially sufficient to meet all future benefits, may for some period, or indeed permanently, be increasing

owing to an excess of current contributions plus income from accumulated funds over current payments of benefits.

4. Within the framework of these three general approaches it is possible to examine the effects of alternative assumptions about the details of the systems involved. Those considered here include variations in the age at which contributions begin, and in the retiring age at which contributions cease and the drawing of pensions begins; the effects of a gradual approach to the target of 50% pensions; and variations in the rate of interest at which accumulated funds increase, and in the rate of increase of average personal incomes. In the calculations the rate of interest and the rate of increase of average incomes have been considered together in the following manner. It is assumed that all benefits and contributions will increase over time at the same proportional rate as average personal incomes. This is slightly more generous to pensioners than the Labour Party's plan (*op. cit.*, p. 97), but it is assumed that pensioners will receive increases of pension after retirement to keep up their real income relative to the national average, both because this is politically so attractive that it is almost bound to find its way into any actual scheme and because it simplifies the calculations. As the average pensioner does not survive very long, it makes very little difference to the total bill for pensions.

5. With benefits increasing in step with the average personal income, part of the return on the accumulated funds of any scheme will be needed to increase the fund by the same proportion as the increase in the benefits which it is due to pay in the future. Thus if average personal incomes increase by $x$% in a given year the total discounted liabilities of the scheme will also increase by $x$%, and to keep the fund actuarially solvent, or to keep a non-actuarial fund in the same proportion to the size required for actuarial solvency, it is necessary to devote the first $x$% of the fund's income to this purpose. The effect of doing this is the same as if personal incomes had remained constant, and the rate of return on the accumulated funds had been $x$% lower than the amount in fact earned.

6. It is also necessary to make some simplifying assumptions about the behaviour of prices during the period of the fund's operation. Thus it is assumed below either that prices are stable or that the funds are invested in such a manner that the real income on them is unaffected by inflation, by the investment of some (undiscussed) proportion of them in equities. The calculations can thus still be carried on in terms of units of average income, the rate of increase of prices being deducted from the rate of return in money terms on the accumulated funds. If the funds were not in fact invested in an inflation-proof manner, then even a scheme which would have been actuarially sound given constant prices would incur an actuarial deficit under conditions of increasing prices. If such a scheme gave rise to extra real savings at the time when the contributions were made, however, then it could be argued that the provision of subsidies to compensate it for the

effects of inflation was a transfer placing no real burden on the rest of the economy.

7. In a purely current scheme, where there are no accumulated funds, the rate of return does not come into the calculations; but the nearer a scheme moves to the opposite extreme of actuarial solvency, the more important the rate of return becomes. In the discussion below the "rate of return" is defined as the gross rate of return in money terms, including capital appreciation, minus the rate of increase of prices, and minus the rate of increase of real average incomes. It is also net of administrative costs. It is not proposed to discuss how large the rate of return, as thus defined, is likely to be over as long ahead as a working lifetime of forty-five or fifty years, but calculations have been made on the alternative hypotheses of 3, 4 and 5%. The assumption that a constant rate of return prevails throughout is itself made purely for simplicity, and is unlikely to be realised in practice.

## I. The Actuarial Approach

8. The method used here is to consider the contributions necessary, measured as a percentage of the average personal incomes of contributing age-groups, to provide funds actuarially sufficient to pay for retirement pensions equal on average to 50% of the average incomes of contributors, and lump-sum payments on death equal to one year's average income of contributors. The basis of these calculations is the Registrar General's current Life Tables [1] for England and Wales. The calculations have been made separately for men and women; if, under an actual scheme, it was decided to combine the sexes and levy equal contributions on both, this would involve a redistribution from men to women in the case of pensions, since women survive longer to draw them, but from women to men in the case of lump-sum payments, since as men die sooner, the value of payments to them on death, discounted to any given date, is greater. Contributions to a combined scheme would lie between the values found for the two sexes separately, but will tend to lie nearer to the mens' rates so long as men's average incomes remain greater. Proposals involving the relating of pensions to the joint incomes of husband and wife also involve a tendency to raise the premiums necessary to provide 50% pensions if these are taken to relate what the individual gets to his own income before retirement, relative to the national average; this complication does not arise with the definition of "50% pensions" used here. In the calculations below the sexes have not been combined, in order to keep clear the actuarial methods used.

9. A further reason for relating 50% pensions to the average incomes of contributors and not of the pensioners themselves before retirement is that the latter definition would require that the correlation between level of income

[1] *The Registrar General's Decennial Supplement, England and Wales, 1951. Life Tables.* H.M.S.O., 1957.

during work, and expectation of life on retirement, should be known. This information is not available; but if there is a positive correlation between income and longevity, then heavier premiums would be required for 50% pensions on the alternative definition. Similar complications arise, and have to be avoided for similar reasons, in considering the levels of contributions necessary if the contributions are related to individual incomes, since the individual's income will tend to vary with age, while the calculations are based on the assumption that the average individual earns the average income throughout his working life. If contributions were actually evenly spread over the working life of the average individual this would involve a crushing burden on the youngest age-groups. One method of avoiding this would be for a larger proportion of the contributions of younger age-groups to be paid by the State, and less by themselves, than in the case of the older age-groups. The alternative would be the levying of equal proportional contributions at all ages, but with higher rates of contribution than those calculated below to allow for the fact that it is the earliest contributions which earn most income during the life of an actuarially based pension fund.

10. It is suggested, however, that the simplest method of considering the effects of lower contributions from younger workers is by analogy with the effects of late entry into the scheme. For example, contributions from 15 to 21 at half the average adult rate are slightly actuarially superior to contributions from 18 to 21 at the full rate; accordingly, the earliest date of entry below is taken to be 18. In the case of the professional and business classes, where incomes may rise markedly for from twenty to thirty years after a late entry to work, such a correction is obviously inadequate; but as there is bound to be some redistributive element about any national scheme, and as the classes concerned are in any case relatively likely to opt out of it, it did not appear to be worth while attempting to allow for this case.

11. With all these provisos in mind, the tables below should give at least some idea of the order of magnitude of the contributions required for various types of benefit, and the effects of varying certain of the assumptions. Table I shows the contributions, expressed as percentages of the average incomes of persons of contributing age, needed to provide, for contributors entering the scheme at various ages, pensions after 65 at a level equal on average to half the personal incomes of those of contributing age. It will be seen that while women's contributions are always about a third greater than men's, age of entry and the rate of return making very little difference to this, the effects of changes in the age of entry, and in the rate of return, are very large. For men, the necessary contributions rise rapidly with age on entry, until with a rate of return of 3% necessary contributions from 35 are 103% above those needed from 20, and with a rate of return of 5%, necessary contributions from 35 are 151% above those needed from 20. Also, a rise in the rate of return makes pensions markedly cheaper, especially for younger entrants; from 20, the premiums necessary

with a rate of return of 5% are only 50% of those needed with a 3% rate of return; and from 35 the contributions necessary with a rate of return of 5% are 62% of those needed with a rate of return of 3%. The greater

TABLE I

*Percentage Contributions for a 50% Pension from 65*

| Age on entry. | Rate of return. | | | | | |
|---|---|---|---|---|---|---|
| | 3%. | | 4%. | | 5%. | |
| | Men. | Women. | Men. | Women. | Men. | Women. |
| 18 | 3·33 | 4·55 | 2·33 | 3·15 | 1·62 | 2·18 |
| 20 | 3·62 | 4·94 | 2·57 | 3·47 | 1·81 | 2·40 |
| 23 | 4·12 | 5·61 | 2·98 | 4·02 | 2·16 | 2·89 |
| 26 | 4·72 | 6·40 | 3·49 | 4·69 | 2·58 | 3·45 |
| 29 | 5·43 | 7·35 | 4·10 | 5·49 | 3·09 | 4·13 |
| 32 | 6·33 | 8·49 | 4·84 | 6·57 | 3·73 | 4·97 |
| 35 | 7·37 | 9·90 | 5·79 | 7·73 | 4·55 | 6·04 |

difference for younger entrants is because any difference in the rate of return makes more difference to the size of a fund over a longer period. Tables II and III show the effects of age on entry and of the rate of return on men's contributions.

TABLE II

*Necessary Contributions as Percentages of those Necessary on Entry at 20*

| Age on entry. | Rate of return. | | |
|---|---|---|---|
| | 3%. | 4%. | 5%. |
| 18 | 92·0 | 90·7 | 89·5 |
| 20 | 100·0 | 100·0 | 100·0 |
| 26 | 130·1 | 135·8 | 142·0 |
| 35 | 203·5 | 225·4 | 250·9 |

TABLE III

*Necessary Contributions as Percentages of those Needed with a 3% Rate of Return*

| Age on entry. | Rate of return. | | |
|---|---|---|---|
| | 3%. | 4%. | 5%. |
| 18 | 100·0 | 69·8 | 48·6 |
| 20 | 100·0 | 70·9 | 50·1 |
| 26 | 100·0 | 73·9 | 54·6 |
| 35 | 100·0 | 78·5 | 61·7 |

12. Bearing in mind that necessary contributions for women are higher, and that the provision of other benefits, expressed for our purposes as their equivalent cost in lump-sum payments, also requires premiums, it is obvious

that after an age of entry of about 35, *i.e.*, for about two-thirds of the present adult population, the contributions necessary for entry into an actuarially sound scheme would become very burdensome with a 3% rate of return, though with a 5% rate of return a few more years would elapse before contributions reached a similarly burdensome level. The above discussion, however, has assumed retirement at 65; and it is possible to calculate the

TABLE IV

*Percentage Contributions Needed for a 50% Pension from Various Ages*

| Age at retirement. | Rate of return. | | | | | |
|---|---|---|---|---|---|---|
| | 3%. | | 4%. | | 5%. | |
| | Men. | Women. | Men. | Women. | Men. | Women. |
| 60 | 6·15 | 7·82 | 4·49 | 5·62 | 3·25 | 4·05 |
| 63 | 4·52 | 5·98 | 3·24 | 4·24 | 2·32 | 3·01 |
| 65 | 3·62 | 4·94 | 2·57 | 3·47 | 1·81 | 2·44 |
| 67 | 2·86 | 4·05 | 2·00 | 2·80 | 1·40 | 1·95 |
| 70 | 1·94 | 2·90 | 1·33 | 1·98 | 0·92 | 1·35 |

effects on necessary contributions of varying the age of retirement. Table IV shows the percentage contributions needed for persons entering the scheme at 20, and retiring at various ages from 60 to 70. The outstanding thing about these figures is the rapid increase of contributions necessary to finance a lower retiring age, and the equally marked reduction made possible by a rise in the retiring age. This is more marked for men than for women, and more marked at high than at low rates of return, as is

TABLE V

*Necessary Contributions for a 50% Pension from Various Ages, as Percentages of Contributions for Retirement at 65*

| Age at retirement. | Rate of return. | | | | | |
|---|---|---|---|---|---|---|
| | 3%. | | 4%. | | 5%. | |
| | Men. | Women. | Men. | Women. | Men. | Women. |
| 60 | 170 | 158 | 175 | 162 | 179 | 166 |
| 63 | 125 | 121 | 126 | 122 | 128 | 123 |
| 65 | 100 | 100 | 100 | 100 | 100 | 100 |
| 67 | 79 | 82 | 78 | 81 | 77 | 74 |
| 70 | 53 | 59 | 52 | 57 | 50 | 55 |

shown by Table V, which gives the contributions necessary for a 50% pension from various retiring ages as percentages of the contributions necessary for an entrant at age 20 retiring at 65. It is thus clear that any general reduction in the age of retirement would greatly increase, and the

adoption of a moderate postponement would similarly ease, the burden of paying for pensions. For retirement at ages over 65, one possible arrangement would be that contributions stopped at 65. This would make comparatively little difference to the levels of contributions needed, as most of the income of pension funds at ages around 65 comes from interest on accumulated funds, and not from current contributions. In the case of entrants at ages over 20, variations in the age of retirement cause even larger variations in the necessary premiums.

13. The other form of benefit whose cost will be considered here is the lump-sum payable at death. No attempt will be made to assess here the number of years' income which would be necessary, on the average, to cover payments such as orphans' allowances; for illustrative purposes the cost of lump-sum payments on death equal on average to the average annual income of contributors has been worked out. As in the case of pensions, this would not be actuarially equivalent to the cost of paying lump-sum benefits equal to the actual income of the individual, unless there was no correlation between income level and age at death; but in this case a positive correlation between income level and length of life would strengthen the scheme's actuarial position, since postponement of the larger payments reduces the actuarial liability at any one time. In view of the assumed

TABLE VI

*Percentage Contributions Needed to Pay One Year's Income on Death*

| | Age on entry. | Rate of return. | | | | | |
|---|---|---|---|---|---|---|---|
| | | 3%. | | 4%. | | 5%. | |
| | | Men. | Women. | Men. | Women. | Men. | Women. |
| Death before 60 | 20 | 0·38 | 0·25 | 0·34 | 0·24 | 0·32 | 0·21 |
| | 26 | 0·45 | 0·28 | 0·42 | 0·28 | 0·39 | 0·26 |
| | 35 | 0·61 | 0·36 | 0·59 | 0·39 | 0·57 | 0·36 |
| Death after 60 | 20 | 0·69 | 0·67 | 0·48 | 0·45 | 0·34 | 0·31 |
| | 26 | 0·90 | 0·87 | 0·66 | 0·61 | 0·48 | 0·44 |
| | 35 | 1·40 | 1·34 | 1·09 | 1·01 | 0·85 | 0·78 |
| *Total* | 20 | 1·07 | 0·92 | 0·83 | 0·69 | 0·65 | 0·53 |
| | 26 | 1·35 | 1·15 | 1·08 | 0·90 | 0·87 | 0·71 |
| | 35 | 2·01 | 1·70 | 1·68 | 1·40 | 1·42 | 1·14 |

purpose of lump-sum benefits it is also desirable to subdivide deaths into those of persons with and without dependants; this cannot be done here in any detail, but as a first approximation the liability in respect of deaths below and above the age of 60 are considered separately. Table VI shows the necessary premiums to pay for these, from various ages of entry up to a retirement age of 65. It will be seen from Table VI that for lump-sum benefits in the case of death at over 60 there is little difference in the premi-

ums necessary for men and women; this is because their later average age at death balances the fact that more women survive to over 60. In the case of death at over 60 the rate of return has a marked effect on the necessary premiums. For lump-sum benefits payable in the event of death before 60, on the other hand, premiums for men are substantially higher than those for women, whereas the rate of return on accumulated funds makes very little difference to the premiums necessary; this is because, as the liabilities of such a fund are spread throughout its life, its aggregate size is never very large. When the contributions necessary to cover lump-sum benefits at death at all ages are added the total is found to vary both with sex, men's contributions being heavier, and with the rate of return, low rates of return making for high premiums. In all cases the premiums rise with the age of entry into the scheme, but more so in the case of benefits payable on death at over 60.

14. Finally, we shall consider the total premiums necessary for an actuarially sound scheme providing both 50% pensions on retirement at 65 and lump-sum benefits equal to one year's average income, payable at death at any age. The premiums needed for such a combination, which is

TABLE VII

*Percentage Contributions Necessary for* 50% *Pensions from* 65 *plus Lump-sum Benefits*

| Age on entry. | Rate of return. | | | | | |
|---|---|---|---|---|---|---|
| | 3%. | | 4%. | | 5%. | |
| | Men. | Women. | Men. | Women. | Men. | Women. |
| 18 | 4·32 | 5·40 | 3·09 | 3·78 | 2·22 | 2·66 |
| 20 | 4·69 | 5·86 | 3·40 | 4·16 | 2·47 | 2·96 |
| 23 | 5·32 | 6·64 | 3·93 | 4·81 | 2·91 | 3·53 |
| 26 | 6·06 | 7·55 | 4·56 | 5·59 | 3·45 | 4·19 |
| 29 | 6·96 | 8·65 | 5·33 | 6·52 | 4·11 | 4·95 |
| 32 | 8·08 | 9·98 | 6·28 | 7·76 | 4·93 | 5·94 |
| 35 | 9·39 | 11·61 | 7·47 | 9·12 | 5·97 | 7·18 |

chosen for illustrative purposes only, are shown in Table VII. It will be seen that the necessary contributions form a higher proportion of income for women than for men, though to a lesser extent than in payments for pensions alone. Contributions rise rapidly with age of entry, to an extent which makes it clear that there can be no question of an actuarially solvent scheme for the older age-groups, though, of course, a scheme providing for less than 50% pensions for older entrants could raise the maximum age for entry into an actuarially solvent scheme. Necessary contributions also vary greatly with the rate of return on accumulated funds.

15. One conclusion which emerges very strongly from the calculations whose results are presented here is that in any attempt at evolving a national

superannuation scheme on an actuarially solvent basis, one of the worst problems would be estimating what level of premiums would suffice to make a scheme actuarially solvent. He would be a bold planner who would attempt to forecast the " rate of return " as defined above, over the next 50 years, or what would be the trend of mortality over a similar period; all the calculations above are based on the 1951 life tables, and the reductions in mortality which are expected over the next fifty years are bound to increase the cost of pensions, through longer survival, by far more than they reduce the lump-sum benefit components of any possible scheme, by postponement. Thus all the premiums worked out above may be expected to be inadequate to an extent which cannot be accurately forecast.

16. A further difficulty with an actuarially solvent scheme is the enormous size of the funds which would be accumulated. Table VIII shows the size of the accumulated fund which would exist at the age of 65, to provide 50% pensions on retirement at 65, in units of average income, per entrant at 20 and per survivor at 65.

TABLE VIII

*Years' Income per Member in a* 50% *Pension Fund, at* 65

| | Rate of return. | | | | | |
|---|---|---|---|---|---|---|
| | 3%. | | 4%. | | 5%. | |
| | Men. | Women. | Men. | Women. | Men. | Women. |
| Per entrant . | 3·24 | 4·48 | 3·03 | 4·16 | 2·85 | 3·88 |
| Per survivor . | 4·70 | 5·58 | 4·40 | 5·18 | 4·14 | 4·83 |

Even granted that this is the maximum size attained by such a fund, and that during the periods of building up and running down the sizes of the funds of other age-groups would be smaller, funds of this size would form a large proportion of the nation's total capital, and the investment of resources on this scale would present major administrative and financial problems.

## II. THE ASSESSMENT APPROACH

17. The second section of this article considers the economics of schemes for pensions and for lump-sum benefits payable at death working on the opposite extreme principle; the assessment principle, under which all current benefits are paid for from current contributions, and no funds are built up. In this type of scheme the rate of return does not matter. Also, as there is no need to provide in advance for the liabilities of the scheme, the problem of forecasting trends in mortality does not affect the solvency of the scheme; but it would be prudent, before any such scheme was adopted, to examine the size of the burden it would place on the other members of the community. For this purpose, use is made of the population forecasts given

by the Government Actuary's Department and Registrar General,[1] carried forward to 2025 by the author by extrapolating the mortality trends assumed in the estimates up to 1995. Table IX shows the resulting forecasts of the population in the age-groups over 20, divided into contributors and pensioners at three possible retiring ages, 60, 65 and 70. From this table can be calculated the percentage contributions from current personal incomes which would be necessary to provide pensioners with incomes equal on average to 50% of the average incomes of those still of working age.

TABLE IX

*Estimated Future Population of Great Britain in Stated Age-groups*

(000,000)

| Year. | Age-groups. | | | | | |
|---|---|---|---|---|---|---|
| | 20–59. | 60 +. | 20–64. | 65 +. | 20–69. | 70 +. |
| 1960 | 27·14 | 8·78 | 30·43 | 6·07 | 32·64 | 3·86 |
| 1965 | 27·43 | 9·55 | 30·48 | 6·50 | 32·89 | 4·09 |
| 1970 | 27·73 | 10·35 | 30·94 | 7·14 | 33·65 | 4·43 |
| 1975 | 27·62 | 11·01 | 30·83 | 7·80 | 33·70 | 4·93 |
| 1980 | 27·74 | 11·16 | 30·60 | 8·30 | 33·49 | 5·41 |
| 1985 | 27·41 | 11·51 | 30·62 | 8·30 | 33·20 | 5·72 |
| 1990 | 27·46 | 11·41 | 30·36 | 8·51 | 33·25 | 5·61 |
| 1995 | 27·74 | 11·10 | 30·49 | 8·35 | 33·10 | 5·74 |
| 2000 | 27·98 | 10·81 | 30·72 | 8·07 | 33·20 | 5·59 |
| 2005 | 27·90 | 10·76 | 30·83 | 7·83 | 33·30 | 5·36 |
| 2010 | 27·12 | 11·41 | 30·65 | 7·88 | 33·29 | 5·23 |
| 2015 | 26·73 | 11·59 | 29·87 | 8·45 | 33·05 | 5·27 |
| 2020 | 26·41 | 11·62 | 29·41 | 8·63 | 32·23 | 5·80 |
| 2025 | 26·20 | 11·50 | 29·10 | 8·60 | 31·80 | 5·90 |

The necessary contributions have also been calculated for a scheme under which pensions start at 30% of the average incomes of those of working age, rising to 50% after 50 years, *i.e.*, by 2010, assuming that the scheme comes into operation in 1960. This appears to approximate to the effects of the gradual introduction of the differential elements of the pensions proposed in the Labour Party's draft scheme. Table X shows the percentage contributions needed on both these assumptions, assuming entry at 20.

18. It is clear from these figures that, whatever the age of retirement, the burden of paying for pensions is due to increase rapidly for the first twenty-five to thirty years of the scheme, but then to level out or decline except in the case of pensions at 60 with a gradual increase to 50%. It is also clear that, just as in the case of an actuarial pension scheme, the burden increases rapidly as the age of retirement is lowered. On the basis of the figures given above, it is obvious that there can be no serious prospect of the retiring age falling below 65 with pensions at or approaching the 50% target. A rise in the retiring age as far as 70 is unlikely, the figure being taken because it can be derived easily from the published forecasts, but a rise of

[1] See *Annual Abstract of Statistics*, 1956, Section II, Table 9.

one year in the retiring age would result in the reduction of necessary contributions by about 1% of average incomes initially, this saving rising to about 1¼% by 2025. Some rise in the retiring age appears to be essential if the burden of contributions under a current scheme is to be kept within reason. In the case of women a retiring age of 65 would itself represent a substantially raised age of retirement.

TABLE X

*Percentage Contributions Necessary for* 50% *Pensions, and for Pensions Increasing to* 50% *by* 2010

| Year. | Retiring age 60. | | Retiring age 65. | | Retiring age 70. | |
|---|---|---|---|---|---|---|
| | 50%. | 30–50%. | 50%. | 30–50%. | 50%. | 30–50%. |
| 1960 | 15·84 | 9·51 | 9·97 | 5·91 | 5·91 | 3·55 |
| 1965 | 17·38 | 11·13 | 10·66 | 6·82 | 6·08 | 3·98 |
| 1970 | 18·67 | 12·68 | 11·54 | 7·85 | 6·58 | 4·48 |
| 1975 | 19·94 | 14·35 | 12·64 | 9·10 | 7·31 | 5·26 |
| 1980 | 20·11 | 15·28 | 13·53 | 10·30 | 8·08 | 6·14 |
| 1985 | 21·01 | 16·81 | 13·55 | 10·84 | 8·62 | 6·90 |
| 1990 | 20·77 | 17·44 | 14·01 | 11·77 | 8·44 | 7·09 |
| 1995 | 20·00 | 17·60 | 13·69 | 12·04 | 8·67 | 7·63 |
| 2000 | 19·31 | 17·77 | 13·14 | 12·09 | 8·43 | 7·75 |
| 2005 | 19·28 | 18·51 | 12·69 | 12·18 | 8·05 | 7·73 |
| 2010 | 21·03 | | 12·85 | | 7·86 | |
| 2015 | 21·68 | | 14·14 | | 7·97 | |
| 2020 | 22·00 | | 14·67 | | 9·00 | |
| 2025 | 21·94 | | 14·77 | | 9·27 | |

19. The contributions required under a current scheme are, of course, much larger than the premiums required from the younger age-groups in an actuarial scheme; but even so, contributors in the near future under a current scheme would be paying in contributions a lower fraction of their incomes than would have to be paid by their successors in, say, 1995, when a person aged 30 in 1960 would retire if the retiring age remained at 65. The excess of contributions on a current, over those needed for younger entrants on an actuarial basis, is of course simply a result of the lack under a current scheme of the large fraction of the income of an actuarially based pensions scheme which comes from the return on its accumulated funds. This difference gives rise to certain problems if a national scheme is not to be compulsory for all—anybody aged 20–30 who was allowed to contract out from a public current scheme into a private actuarially based scheme would have a strong incentive to do so. The Labour Party's draft plan avoids this difficulty by making the "basic" part of its pensions scheme compulsory, and arranging the differential element so that it is fairly similar to an actuarially based scheme.

20. The cost of lump-sum benefits on a current basis can also be calculated, at least approximately, by deduction from the population forecasts,

adjusted for migration.[1] Table XI shows the contributions needed, as a percentage of the incomes of persons aged 20–65, to provide lump-sum benefits payable at death equal on average to one year's income of contributors. With 1951 mortality figures, 20% of the male and 13% of the

TABLE XI

*Percentage Contributions Needed for Lump-sum Benefits on Death Equal to 1 Year's Income*

| Year. | Estimated deaths (000). | Percentage contribution. |
|---|---|---|
| 1960 | 580 | 1·91 |
| 1965 | 595 | 1·95 |
| 1970 | 614 | 1·98 |
| 1975 | 632 | 2·05 |
| 1980 | 660 | 2·16 |
| 1985 | 686 | 2·24 |
| 1990 | 704 | 2·32 |
| 1995 | 704 | 2·31 |
| 2000 | 701 | 2·28 |
| 2005 | 686 | 2·23 |
| 2010 | 686 | 2·24 |
| 2015 | 688 | 2·30 |
| 2020 | 692 | 2·35 |
| 2025 | 702 | 2·41 |

TABLE XII

*Percentage Contributions Needed for Pensions at 65 Increasing from 30% in 1960 to 50% in 2010, plus Lump-sum Benefits on Death*

| Year. | Pension. | Lump-sum. | Total. |
|---|---|---|---|
| 1960 | 5·91 | 1·91 | 7·82 |
| 1965 | 6·82 | 1·95 | 8·77 |
| 1970 | 7·85 | 1·98 | 9·83 |
| 1975 | 9·10 | 2·05 | 11·15 |
| 1980 | 10·30 | 2·16 | 12·46 |
| 1985 | 10·84 | 2·24 | 13·08 |
| 1990 | 11·77 | 2·32 | 14·09 |
| 1995 | 12·04 | 2·31 | 14·35 |
| 2000 | 12·09 | 2·28 | 14·37 |
| 2005 | 12·18 | 2·23 | 14·41 |
| 2010 | 12·85 | 2·24 | 15·09 |
| 2015 | 14·14 | 2·30 | 16·44 |
| 2020 | 14·67 | 2·35 | 17·02 |
| 2025 | 14·77 | 2·41 | 17·18 |

female deaths take place before 60, and these proportions will fall as mortality decreases. Provision for lump-sum payments on death before the age of 60 costs very little more on a current than on an actuarial basis, but in the case of death at over 60 the current basis requires contributions far above those for entrants at 20 to an actuarial scheme.

[1] The adjustment is very crude in the absence of detailed forecasts of the age-distribution of migrants; the question of the status of migrants under a national superannuation scheme will itself present some problems.

21. Finally, for illustrative purposes Table XII shows the total premiums necessary for a combined scheme providing for contributions from 20 to 65, and pensions for those over 65 rising from 30% in 1960 to 50% in 2010, plus lump-sum benefits on death at all ages equal to one year's average income of contributors. The total cost of such a combined scheme would rise sharply, increasing by 80% in the first thirty years of the scheme, and continuing to rise, though more gradually, afterwards. A desire to avoid a rising rate of contributions, and to take advantage of some of the benefits from investment income of an actuarial scheme, has obviously prompted the third alternative method of financing pensions, that of the non-actuarial fund, as proposed in the Labour Party's draft scheme.

## III. A Non-actuarial Fund

22. It remains to investigate the implications of paying national superannuation benefits out of a fund which, although not actuarially solvent, would serve both to even out the level of contributions over time and to lower their ultimate level by providing at least some income from accumulated funds. The growth of such a fund is strongly dependent on the level of contributions, since the fund can be considered as the difference between a fund built up by the stream of contributions flowing in and growing at compound interest and a fund built up from the stream of benefits flowing out and growing in a like manner. A small variation in the level of contributions relative to the level of benefit payments can thus make a very large proportional difference to the rate of growth of the residual fund. This can

### Table XIII

*Size of Pension Fund Financed by Contributions of* 10% *of Incomes and Paying Pensions Rising to* 50% *in* 2010

(In units of 1 million average incomes)

| Year. | Rate of return. | | |
|---|---|---|---|
| | 3%. | 4%. | 5%. |
| 1960 | 1·12 | 1·12 | 1·12 |
| 1965 | 7·12 | 7·31 | 7·51 |
| 1970 | 12·46 | 13·19 | 13·97 |
| 1975 | 16·77 | 18·43 | 20·27 |
| 1980 | 19·77 | 22·77 | 26·22 |
| 1985 | 21·91 | 26·67 | 32·42 |
| 1990 | 23·16 | 30·18 | 39·06 |
| 1995 | 23·72 | 33·52 | 46·60 |
| 2000 | 24·09 | 37·24 | 55·97 |
| 2005 | 24·42 | 41·73 | 67·78 |
| 2010 | 24·11 | 46·53 | 82·14 |
| 2015 | 22·18 | 50·73 | 98·85 |
| 2020 | 18·72 | 54·60 | 118·89 |
| 2025 | 14·36 | 58·94 | 144·10 |

be seen by comparing Tables XIII and XIV. Table XIII shows the size at five-yearly intervals of a fund financed by contributions equal to 10% of the average income of persons aged 20–64, and paying out pensions to persons over 65 rising from 30% of the average income of persons of contributing age in 1960, to 50% of the average income of persons of contributing age after 2010. The rate of return here is that defined above. Table XIV shows the size at equal intervals of a fund financed by a 1% contribution from the incomes of persons aged 20–64 with no expenditure. It is apparent on comparing these tables that the size of a non-actuarial pension fund at any date depends strongly on the rate of return assumed on invested funds. Also, it is clear that a quite small variation in the level of contributions could alter the size of the resulting fund to almost any desired extent. Thus with

TABLE XIV

*Size of a Fund Financed by* 1% *Contributions, with no Expenditure*

(In units of 1 million average incomes)

| Year. | Rate of return. | | |
|---|---|---|---|
| | 3%. | 4%. | 5%. |
| 1960 | 0·30 | 0·30 | 0·30 |
| 1965 | 1·97 | 2·02 | 2·07 |
| 1970 | 3·92 | 4·12 | 4·34 |
| 1975 | 6·18 | 6·69 | 7·25 |
| 1980 | 8·79 | 9·80 | 10·95 |
| 1985 | 11·82 | 13·58 | 15·66 |
| 1990 | 15·32 | 18·18 | 21·67 |
| 1995 | 19·37 | 23·76 | 29·34 |
| 2000 | 24·08 | 30·57 | 39·14 |
| 2005 | 29·55 | 38·86 | 51·66 |
| 2010 | 35·89 | 48·94 | 67·63 |
| 2015 | 43·21 | 61·18 | 87·98 |
| 2020 | 51·66 | 76·03 | 113·93 |
| 2025 | 61·44 | 94·07 | 147·02 |

a rate of return of 3%, a cut of $\frac{1}{4}$% in the rate of contributions could reduce the fund to zero in 2025, or an increase of $\frac{1}{4}$% could double it. With a 4% rate of return, a cut of 0·62% in the rate of contributions would be needed to reduce the fund to zero by 2025, and with a 5% rate of return, a cut of almost 1% could be made. Thus the necessary level of contributions depends only slightly on the rate of return on invested funds. The exact size of the contributions levied would depend on the views of the governments administering the scheme as to how large it was desirable that the accrued funds of a national superannuation scheme should be at any time.

23. If it was desired to finance lump-sum benefits on a non-actuarial fund basis, funds reducing to approximately zero in 2025 could be provided by contributions of 2·2% of average incomes with a 3% rate of return, or of 2·1% or 2·05% if the rate of return was 4% or 5% respectively. One advantage of a non-actuarial fund is that if the original forecasts concerning

either mortality or the rate of return prove to be wrong the results can be corrected by a comparatively small change in the level of contributions, though the later such a correction is left, the larger it will have to be. On the other hand, a non-actuarial fund must levy contributions in the early years which are larger than those which would be required on a current basis; for it is only by this means that the funds are built up, the income from which enables the contributions in later years to be reduced below those which would be required on a current basis.

24. The desirable level of the funds connected with any national superannuation scheme cannot be discussed in detail here; it must depend partly on the view which is taken of the optimum size of such a fund from the point of view of finding investment opportunities, and on opinions concerning the merits or otherwise of institutional investment; and partly on an assessment of how far the savings embodied in such a fund are additional to, and how far they are substitutes for, savings which would have been made in other ways either by individuals or by institutions, including the State.

25. This article has thus presented at least provisional figures concerning the orders of magnitude involved in the three alternative approaches to national superannuation: the actuarial approach, the assessment, or current, approach and the non-actuarial fund. It is emphasised that these depend on very hazardous forecasts concerning mortality, which may well not be realised; it is also emphasised that the modification of the above figures to cover a scheme in which the pensions and other benefits are related to the average income during working life of the individual contributor, relative to the national average, would require detailed knowledge of the correlation between income level and longevity, which is not available for the present, let alone the future. Thus it is possible to do little more than indicate orders of magnitude based on alternative hypotheses. It is hoped, however, that even this will help in an intelligent assessment of the economic consequences of any proposed national superannuation scheme.

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# REVIEWS

*Lord Norman.* By SIR HENRY CLAY. (London: Macmillan, 1957. Pp. ix + 495. 36*s*.)

SIR HENRY CLAY was killed in a road accident when he had been working for four years on this book and had almost completed his first draft. The sponsors—the Court of the Bank of England and Lord Norman's family—were then presented with the difficult question of how the work should be prepared for publication. They decided to go forward with the help of Norman's friends and former colleagues at the Bank of England. Two of these contributed postscripts to take the place of Clay's intended final chapters, and his draft of the rest, though submitted to minor editorial revision, remains "intrinsically Clay's work in his own words."

Let it be said at once that the editorial decision was eminently right. Clay, an economist of high academic standing, had a long personal knowledge of his subject; he had enjoyed full access to the Bank's records, Norman's private papers and the papers of Norman's opposite number across the Atlantic, Benjamin Strong; and this book was to Clay a labour of love. To leave the draft unpublished was therefore unthinkable. Of the two additional chapters, it was not unreasonable to confine one ("The Second World War") to a brief factual survey. The second, "The Man," though drawing again and again on Clay's own chapters, is certainly not the appraisal Clay himself would have written, but it can stand by itself as a fascinating portrait, as fine a piece of biographical writing as has appeared for a long time. In Clay's own chapters "every effort has been made to avoid re-writing and to preserve the balance of emphasis and judgment." I doubt whether Clay would have revised more drastically; he was not a writer of high polish, though like any other author he would no doubt have gone back to sharpen his paragraphs after he had seen the whole emerge under his hand. There are in fact very few blemishes to remind the reader of the book's sad hiatus; only in the second section of Chapter VI had I any sense that Clay had intended to go back and insert further sentences.

Unlike political history, economic history has little room for biography. To the shaping of economic events few men make such highly personal contributions as warrant detailed attention to their lives, but Montagu Norman, with some inborn luck and some abilities, but mainly by sheer force of character, made himself one of these few. The puzzles inherent in his singular claim to attention enhance the interest in the more personal side of his story; how was it that, lacking in intellectual training and indeed in trainability, lacking in health and often lacking in patience, he yet won unique command in a field where perception and persuasion and a certain toughness all count tremendously? Clay's early chapters will be

eagerly studied for the light they throw on these problems: I confess—and I say this not in any critical spirit—that for me the problems remain a long way from solution. Perhaps the most significant episodes are Norman's travels in the United States and his service in the South African War. His early American visits had chance origins (I count this in his luck of family circumstances), but it is apparent not merely that Norman worked hard to understand his hosts but that he drove himself to make the most of these unusual opportunities. At the height of his career this experience was to be immensely valuable. The United States was just becoming critically important in international economic relations, and Norman was among the first to appreciate it and the most able to cope with it. In his middle twenties he had sat through debates in Congress and, in days before the aeroplane offered its soft option, he had travelled West and South to learn the dreary width of Texas and the continental range of America's economic activities. All this was to bear fruit in the close link between Governor Strong of the New York Reserve Bank and Governor Norman of the Bank of England.

The second illuminating episode—the South African War—interrupted one of these American tours, though not in quite the spectacular way told by pre-Clay tradition. This episode is important in quite a different way: it gave Norman no peculiar advantage for his personal mission in later years. Yet somehow it must hold a clue for us: for looking over the whole of Norman's life, it seems almost certain that this was his happiest time. What was it about his active service as a subaltern in the Veld that gave him such satisfaction? What is there in this satisfaction to link with the missionary zeal of Norman's Governorship of the Bank?

My guess is that the link is with an aspect of the Governor's activity that hardly appears in this book. Not that that work receives too little attention here; on the contrary, three-quarters of the book is (very properly) devoted to the Governorship. Clay's account is of the most authoritative kind: besides drawing on his own direct knowledge (extending over more than half the period) Clay was allowed to see and to quote at length from the Minutes of the Court, and other Bank records. It is something new for these records to be quoted within twenty years of their origin, and it is to be hoped that Clay's effective use of them in the advancement of knowledge will encourage the Bank to follow the precedent. In this book they have been used as the foundation of three major aspects of Norman's work: the restoration of the gold standard, subsequent international banking relations and the re-organisation of British industry. On these three subjects Clay's account is likely to remain a standard authority.

The first and second—the restoration of the international standard and subsequent international relations—are closely linked, in that the return to gold was viewed by Norman as a major contribution to the establishment of sanity in international economic relations, and all that followed was,

until 1931, an attempt to hold and improve upon that position and after 1931 to make the best of what was left. The account of Norman's part in the return to gold holds no surprises. Norman appears as one who assumed all through that the return must be at the old parity, but he was ready to postpone and postpone until conditions were reasonably propitious—though he appears (pp. 147–8) to have rejected the 1923 proposal that the Gold Export Control Act should, to give elbow-room, be extended to 1930. Once the deed was done, Norman was willing to experiment surprisingly freely in his determination to make things work. Chapter VI shows that the term "gold standard" at once became a travesty: a mechanism we should now describe as "E.E.A." was in fact working smoothly in 1927–29 (see especially p. 255), and little invention was required when the situation of 1932 had to be faced. (The account, on pp. 402–3, of this last is not altogether satisfactory, and it is difficult to believe that Snowden's famous phrase about "embarrassment to our trade" did not mean what Englishmen as well as foreigners took it to mean.)

All the time, Norman was trying to lessen England's difficulties—and the world's difficulties—by discussions and correspondence not only with Benjamin Strong in New York but with other central bankers throughout the world. Clay's account of these occupies much of the middle part of the book, but I missed reference to Norman's own formulation of his reasons. In a letter, not quoted here, to another central banker Norman explained that the central bankers must be the economic statesmen of the world: politicians, always being subject to electoral favour, could not be expected to take the long view that was required in facing the world's economic problems, and the central bankers, more firmly in the saddle, must do the job for them. This philosophy of central banking explains Norman's readiness to stray from what might be claimed as the proper sphere of the banker; it may also be part of the reason for his eventual (surprisingly late) acceptance of his position as a permanent Governor.

This philosophy can scarcely explain the other part of Norman's work that bulks large in this book: his concern in the reorganisation ("rationalisation" was the contemporary word) of the old staple industries of Britain. It might be supposed that this pre-occupation had a rational connection with Norman's gold standard policy: he thought no tinkering with exchange policy could avert the need for major reshuffling of Britain's industrial capacity. That adjustment, he considered, had to be made in any event, and he might have argued that, having done the best he could to restore international trade, industrial reorganisation was the logical complement, to take care of the remaining disequilibrium in the British economy. There is, however, no evidence in this book that Norman rationalised his actions in this way. His industrial interest was, it is clear, altogether more accidental. In the course of private banking business he would not have regarded as ordinarily proper to a central bank,

the Bank became involved in the future of a mammoth firm in one of the depressed industries. Norman, ready to run wherever the public interest (and a certain gluttony for work) would lead him, plunged deeply into this, and having become doctor to one of the patients, was led on to other industries that were also in the sick ward. The profits the Bank had made in the conduct of its other business gave Norman a purse from which he could draw in aid of these schemes, and his interest eventually became minute. The story is told at length by Clay, whose particular sphere of interest it was while he was employed by the Bank. Perhaps for this reason—though also no doubt out of tenderness for living persons—the story is told impersonally, perhaps too impersonally considering Norman's highly personal way of arranging things. It is also told uncritically: there are alternative views about how Britain's industries should have been put in order, and future industrial historians must not content themselves with Clay's version. But they will find it extraordinarily valuable. They should also, when they are assessing Norman, notice (in Postscript I) that during the Second War the future of British industry was a major preoccupation of Norman's.

But what of Bank Rate, open-market operations, relations with the commercial banks, the " hint from headquarters " and all the rest of the business that is the heart of central banking? The reader will indeed find innumerable points referring to these matters, but they add up to surprisingly little of the book. I suspect that this justly reflects the proportion they occupied of Norman's time. They were regarded as his own institution's technical business, and Norman took them in his stride without stopping to reason about them. Perhaps his attitude to Bank Rate was unduly moulded by the event in his first month as a Director: Campbell came in, he saw the figures, he put Bank Rate up without waiting for anyone, " and he was dead right." (I have told the story as Clay told it to me, not quite as it is told on p. 56.) This was to Norman's taste; he was not tempted into intellectual explanations, and when other people offered them (the Cunliffe Committee in 1918, and even Keynes in 1930), the story remained relatively simple. And what is true of Norman on Bank Rate is also true of his attitude towards other facets of the Bank's central business. He was always aware of the dangers of a big floating debt, never appears to have argued it out convincingly, but most often he probably pushed policy in the right direction.

All these things play quite a minor part in the book. On some there was perhaps rather more to be said. For example, there is very little (it is on pp. 130–1) on Norman's influence on the amalgamations among the commercial banks; future historians must look elsewhere for reference to his quite considerable interest. Similarly, the reader will gain little idea of the intense and active interest Norman took in the personnel not only of the City itself but of a much wider circle of British industrial and

trading concerns. (This highly personal activity is perhaps the link with Norman's satisfaction in South Africa.)

If I have in these paragraphs stressed some of the omissions of this book, this is not ingratitude: it is rather that the book is so important, and should be so widely studied, that its shortcomings thereby themselves become important enough to call for attention. This is, I will venture to say, the best as well the most important book Sir Henry Clay wrote: it must have the attention of all serious students of banking, of international economic relations and of the economic history of the first half of this century.

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*Lloyds Bank in the History of English Banking.* By R. S. SAYERS. (London: Oxford University Press, 1957. Pp. xii + 381. 35*s*.)

THIS work "is essentially a picture of English Banking development, mainly during the nineteenth century, as it appears in the records of Lloyds Bank and the host of other banks from which Lloyds Bank has grown" (Preface, p. 5). It was not to be expected that the records would be anything like complete. "There are, alas, serious gaps." But when the material from the branches was collected, "what at first glance seemed a desert was soon a garden almost choked with fruit and flowers—and weeds."

The past records of business concerns, when by good fortune they have been preserved, nearly always yield results of value to economists. And Professor Sayers has made good use of his material in telling the story of the 166 separate banks which have gone to the making of the Lloyds Bank of the present day.

He has not given us a continuous chronologically arranged narrative, but the successive chapters deal each with its own aspect or topic.

A preliminary chapter is given to "The Roots of Lloyds Bank." It started in Birmingham in 1765 as a private partnership, Taylors and Lloyds. The last Taylor dropped out in 1852, and as Lloyd and Co. the bank was converted into a joint-stock company in 1865. The chapter surveys in summary fashion the principal groups that were destined later on to amalgamate with it. It tells us something of the Lloyd family, whose connection, first as partners and then as directors, has been continuous to the present time.

In 1770 two of the partners in Taylors and Lloyds started a bank in Lombard Street, in which successive generations of Lloyds held partnerships till (after amalgamation with Barnetts Hoares in 1864) it was merged in Lloyds Bank in 1884. A genealogical tree shows in concise form the various branches of the Lloyd family and the partnerships and directorships they held.

Chapter 2, "The Bankers," is devoted to personalities, especially those who became Chairmen of Lloyds, and some who achieved distinction in

groups subsequently merged in it, for example, E. B. Merriman, who was responsible for the amalgamation policy of the Capital and Counties Bank. The Lloyd family contributed Howard Lloyd, who was General Manager for more than thirty years (1871–1902), and just lived to see the crowning amalgamation of Lloyds with the Capital and Counties in 1918.

Chapters 3, "Staff," and 4, "Customers," have gleaned much material of social interest. The next four chapters are concerned with matters of financial and business organisation. Chapter 5, "Country Bankers and London Agents," is full of interesting information as to the manner of carrying on business in the banking world of the nineteenth century, when the development of branch banking was still inconsiderable. Chapter 6, "Relations with the Bank of England," is occupied chiefly with questions of note issues and of the Bank of England branches. Broader questions of policy come into view with Lidderdale and the Baring crisis (pp. 155–6 and 208). It is interesting to find Lloyds resorting in an emergency to the telegraph as early as 1856, to make payment to the Bank of England in London and procure a transfer of gold from the Bank's branch in Birmingham (p. 205).

Chapter 8, "Employment of Funds," tells us something of the standards of liquidity of the private banks and early joint-stock banks, also of the nature of their investments. Before limited liability, the entire fortunes of partners or shareholders formed the backing of a bank's obligations, and it was natural to regard a miscellaneous collection of investments as eligible. Consols were by no means the perfect investment. The heavy depreciation after 1900 found out the weakness of more than one small bank (p. 256). And the idea that Consols were always saleable was rudely shaken by Lloyds' experience at the time of the Baring crisis of 1890, when jobbers refused to make a price (p. 213). The War of 1914 solved the problem of investments by furnishing an inexhaustible supply of short- and medium-dated Government securities (p. 189).

The book winds up very suitably with a chapter on "Amalgamation and Expansion." Occasional mergers and absorptions occurred in the early part of the nineteenth century, but, from the standpoint of Lloyds, the story may be said to begin with the amalgamation in 1884 of Lloyds, still a Birmingham bank, with Bosanquet, Salt and Co., and with Barnetts Hoares. These were Lombard Street banks, with seats at the London Clearing House, and Barnetts Hoares still maintained its family connection with Lloyds. Lloyds acquired the much-desired clearing facilities, but the transfer of the Head Office from Birmingham to London was a gradual process completed only in 1910.

The Capital and Counties Bank had absorbed a London bank and gained a seat at the Clearing House a few years earlier than Lloyds, and it was the vigorous and country-wide policy of absorptions and mergers thenceforth pursued by both that prepared the way for their union in 1918, when

Lloyds had 888 offices, and the Capital and Counties 473 (p. 265). A pair of maps shows conveniently the local distribution of the branches of the two banks.

An Appendix supplies a complete list of banks merged in Lloyds Bank, with dates of foundation, change of partnership and ultimate absorption. Other appendices give a list of the present branches, and biographical notes of the many personalities referred to.

Professor Sayers has made a fine response to the opportunity given him. He has made a subject which might easily have been dry very interesting and readable, and has made an important contribution to the history of banking in England.

RALPH HAWTREY

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*Business Cycles and Economic Policy.* By E. LUNDBERG. Translated from the Swedish by J. Potter. (London: Allen & Unwin, 1957. Pp. xx + 346. 32*s.*)

PROFESSOR LUNDBERG is well placed to review post-war Swedish experience of the management by the Government of the economy. As head of the (official but independent) Konjunktur Institutet for most of the post-war years, no one had a better chance to study what went on. This book started as a study of the functioning of economic controls; but as Professor Lundberg explains,

> "it soon became clear that the methods of physical regulation employed in Sweden during and after the war could only be satisfactorily analysed if comparisons were made with more general methods of economic policy and, in particular, with monetary and fiscal measures. In order to make such comparisons, I extended the scope of my investigations to include the discussions and experiences of the latter types of policy in the inter-war period. This obviously entailed a study of Swedish economic fluctuations and general development over the whole period from 1918 to the present."

The Swedish edition was published in 1953. In the English version some parts have been omitted, and the discussion revised to take account of events since 1953.

Professor Lundberg's real interest is with economic policy, not with economics as a behavioural science; and the book gives a clear indication of his own predilections. But these are supported by arguments of a general and often elementary nature, and do not logically depend on empirical evidence. Much of the time he is tilting at what one imagines was a prevailing interventionist orthodoxy: he has (as he disarmingly says) "a rather idealized picture of how a private economy with a well-functioning price-system might behave under favourable conditions" and "a distrust of power-loving and ambitious government administration."

In his historical analysis of economic developments in Sweden, Professor Lundberg makes a case for supposing that the fluctuations both in the level of activity and in the price level in Sweden in the inter-war period were imported from abroad, and that without outside influences conditions in Sweden would have been fairly stable. The balance of payments remained fairly well in balance despite large swings in both exports and imports, which is to be explained in part by the fact that output was allowed to fluctuate in sympathy with fluctuations in exports. The analysis is, however, comparatively unanalytical, and at times seems to pay too little regard to alternative interpretations of the data. To take one rather important instance, the large deficit on the balance of payments in 1947 is ascribed to an increase in the pressure of demand (p. 65); but one would have imagined that the previous over-issue of import licences (criticised on p. 272) had something to do with it.

Professor Lundberg's account of the " economic policy debate of the inter-war period " is of interest, among other things, for showing that the application of modern economic ideas was at that time very limited, so that they can be given little of the credit for the recovery of prosperity in the late thirties. There are references at various points to an occasional but rather terrifying extremism in the attitude of economists: Wicksell in 1918 demanding in the interest of " honesty " that the price level be restored to its pre-war level; Lindahl suggesting (in 1935) that the Riksbank should direct the Minister of Finance on the preparation of budgetary policy so that the latter might be integrated with monetary policy; or Cassel (also in 1935) inveighing against the " crippling " effect of public works.

The logic of Professor Lundberg's own philosophy is roughly as follows. His acquaintance with national-income forecasting leads him to the conclusion that it is an inexact art. It follows that budgetary policy is not so precise a means of influencing the economy as might be supposed. The same holds for controls (particularly controls over imports or investment): moreover, if long retained, controls (particularly price control) obstruct the working of the price system. For these reasons Professor Lundberg favours " general " methods of influence rather than detailed, specific interferences; and (for reasons made less explicit) he tends in fact to emphasise monetary rather than budgetary policy, though without inquiring how effective it is or whether effective for the same purposes.

One of the most interesting passages is the description of monetary policy since 1945, and some fun is had with the lack of monetary policy in the early part of the period. This is an easier task than it would be here, since monetary policy appears to have been highly explicit. Some *Communications to King* by the Board of Directors of the Riksbank were indeed nothing if not technical (see p. 141). Professor Lundberg, however, puts in a most unfashionable plea for " an atmosphere of uncertainty and

perhaps even mysticism" in the conduct of monetary policy: one can only wonder how he would have liked it in fact. Also interesting is the discussion of the working of controls in Sweden. Professor Lundberg touches on the difficulty of retaining staff to administer controls when the war period was over; and suggests that some of the delays operating import controls were unnecessary. He discusses the case for using import restrictions in a balance-of-payments crisis as an alternative to deflation; but would seem from various remarks to be surprisingly happy to incur the latter to avoid the former (pp. 277–8). He seems to overstate the case against building controls. Towards price control he is surprisingly kind, admitting that it can and did at various times stabilise prices or moderate the speed of price rise; and by checking speculation also restrain the pressure of demand. This, however, does not remove its general disadvantages, at least as a permanent policy. A long discussion of wages under full employment seems to lead to little conclusion except that the degree of full employment must be an important factor in determining the rate of wage increase (p. 258); and at one point (p. 335) though not always (see p. 246) he calls for "some renunciation" of full employment.

Professor Lundberg's injections of scepticisms are doubtless valuable. But at times the reader may think that he has been insufficiently sceptical about his own position. Thus his exposure of the difficulties of forecasting affects *all* kinds of economic policy not merely budgetary policy (since all kinds of economic policy take time to have effect); and the only moral which follows is that Ministers of Finance must do the best they can. At times Professor Lundberg seems to go so far in scepticism as to doubt the possibility of knowledge of economic relationships (p. 295). But this can hardly be the real belief of one who has written what is an assertive book about economic policy and economic developments.

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*The Image.* By K. E. Boulding. (Ann Arbor, Michigan: University of Michigan Press, 1956 (London: Oxford University Press, 1957). Pp. 175. 30*s*.)

The content of this book is a single profoundly suggestive idea developed with brilliant virtuosity and the fertile play of wit over an impressive store of modern culture. The *image* is the entire configuration of concepts, assumptions conscious and unconscious, theories, beliefs, valuations, myths, "make-pretences" and mental elements of every kind, which exists in a man's mind, having evolved and grown up there by virtue of all his life's experience and always open to be further modified by fresh "messages" from nature, from other persons and from the "transcript" or written record of man's historical ordeal and all that it has taught him. The

image it is which gives particular shapes to his responses to challenges and stimuli and the general necessity to contend with the environment. When demands are made upon him, his " image " tells him how to react.

In a less all-pervasive and richly many-sided form, ideas of somewhat related tendency have been used by neuro-physiologists and psychologists under the name of the *schema*, and very recently indeed by Professor G. P. Meredith under the name of the *modulus* (in Chapter XIV of *Uncertainty and Business Decisions*, edited by C. F. Carter *et al.*, 1957). Professor Kenneth Boulding's conception in its universality of application and explanatory power seems entirely his own, and its creation will surely stand as one of the most striking products of the Center for Advanced Study in the Behavioral Sciences (known in some quarters as the Think Tank) at Palo Alto.

Eight chapters of the book, following an Introduction and followed by a vista of possible development and use, are eight branches of a single tree. Professor Boulding shows how " the image " works at the biological, the intellectual and the social levels, and in the epistemic, the economic and the political spheres and in the whole course of human development and history. Is the tale convincing? It is at any rate enthralling. The reader sits agape while the whole nature of man is unfolded before him, swiftly, seductively, with homely illustrations, vivid strokes of irony and an unfailing verve and coruscating wit. Perhaps the whole enterprise is too all-embracing. It is difficult, after one has laid the book down and taken time for sober reflection, to believe entirely that incisive and exact results will be secured, very directly, from a conception which claims applicability to genes and even to viruses as well as to firms, governments, societies, churches and civilisations. But this criticism will perhaps be welcomed by the author: it is, I suspect, just what he wanted someone to say, in order that he might pin it down as the central defect of the modern academic outlook: the belief in the necessity for ever-greater specialisation, the neglect of the search for a universal principle, a unique key to the whole cosmos of man's nature, conduct and history.

If I had to pick out one chapter as containing the author's deepest undercurrent of thought and feeling about the nature of things and the purpose of life, it would be the one called " How manifest is destiny?" Here he has pushed aside a little the curtain of iridescent verbal foam and let us glimpse his *own* image: it may be guessed to be as serious in its ultimate concerns as the vehicle of his thought is racy and high-spirited. There is in the book a great deal about biology, yet the connections between the brain and the mind are admitted to be still mysterious and perhaps impenetrable. It is no doubt an essential part of the author's design to carry the foundations of his idea down, as it were, to neural bedrock; yet the gulf to be bridged between the most successful of the human sciences, economics, and even the psychologist's universe of discourse is so great that any remoter

contacts seem unlikely to be profitable. The economists do not get high marks from Professor Boulding. They " have badly neglected the impact of information and knowledge structures on economic behaviour and processes." It is true; and the understanding of explicit decisions, where these are the key elements in swinging a firm or an economy into a new channel, must surely depend on just such a line of attack as he is proposing. Yet in a sense it is the very efficiency of the central economic mechanism, the market, that absolves us from studying it from the psychologist's viewpoint. The market is a communications system, a prime object, one might therefore think, for the cyberneticist. But not a bit of it. The market handles and uses its information with so little fuss that in its communication aspect there is little to study.

I cannot accept Professor Boulding's pious claim that Henry Ford invented the motor car; but there is no doubt that in the Behavioral Research Center, the heirs of his achievement, invented something of incalculable potentialities.

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*Location and Space-Economy*. By W. ISARD. (New York: Technology Press of the Massachusetts Institute of Technology and John Wiley (London: Chapman & Hall), 1957. Pp. xiii + 350. 70*s*.)

To those who have struggled with Lösch, this book will be very welcome. It is clearly written and employs familiar techniques. That does not mean, alas, that Professor Isard has written an " easy " book. For instance, to anyone not acquainted with the literature, the chapter entitled " Some General Theories of Location " (and specially its appendix) will in large part be incomprehensible, as will certain extensive applications of Palander's diagrammatic techniques in the chapter entitled " Partial Graphic Synthesis and Summary." The non-specialist should probably skip these chapters on first reading, while everyone is advised to omit the first chapter, entitled " Posing the Location and Regional Problem," which is distressingly dull, full of rhetorical questions and of no consequence to what follows. The remainder, however, is very well worth reading.

Professor Isard maintains, and undoubtedly quite rightly, that the problem of location can be very adequately tackled with traditional tools. The individual unit of decision will act to maximise profits or utility. Maximisation implies that (given the possibility of continuous variations) no substitution between its decision variables can increase its advantage. Define a transport input as the movement of a unit weight over a unit distance. Then the location of, say, a producer can be determined from the condition that no substitution between transport inputs, or some transport input and anything else, should be capable of increasing his profit. All that has happened is that in the definition of profit, transport costs,

and in the formulation of the transformation function, location, are explicitly taken into account. This is not always easy to do mathematically, but the principle is clear and obvious. It is, for instance, evident that if the prices of all inputs, other than transport inputs, are independent of the location of these inputs, that the producer will locate where transport costs are minimised. This is called " transport oriented location." But if, for instance, labour is cheaper in one place than it is in another, substitution between transport and labour inputs affects costs, and the optimum might be found at the point of cheapest labour (labour oriented). Professor Isard examines all these cases with patience and skill and shows how " the substitution principle " makes light work of the sometimes extremely ponderous and rather special constructions of his predecessors. He does not treat of those cases where, because of the absence of continuous variability, the techniques of programming would be most appropriate, but we are promised an analysis of such cases in a further volume, which will also deal more extensively with the determination of transport rates and costs which are taken as given here.

Having established that the location of a unit of production can be determined by familiar methods, Professor Isard turns his attention to the general equilibrium aspects of Location Theory. Here the analysis of " market and supply area " is an important first step. Given the location of two producers of an identical good, what their market area will be can be easily determined given their cost function and transport costs. The reverse problem: given the market area (in the simplest case a straight line with uniform customer density) where will two producers locate, a problem made familiar by Hottelling and Chamberlin and others, is more difficult and admits of a number of answers. Professor Isard's guidance in all this is firm and sure. One puzzle remains. It is easily shown that given a uniform distribution of resources and people and free entry, that the only possible market areas are either triangles, squares or regular hexagons. It is also not excessively difficult to show that only hexagonal markets area lead to a " Pareto optimum." What is not so clear is how competition leads to the establishment of such areas. Lösch is not very clear on this, and Professor Isard (in the mathematical chapter) only shows that squares and triangles do not minimise society's transport costs. This is quite an interesting problem, since, as Lösch has shown, distance and transport costs inevitably imply that a negatively inclined demand curve faces individual producers, and it may well be, although I have no proof, that perfect competition as usually understood would never lead to an " efficient " net of market areas. Perhaps Professor Isard will return to this in his future work. His criticisms, by the way, of Lösch are all just and interesting.

We are next led to a discussion of forces making for agglomeration (external economies and the like) and to a theory of agricultural location. The latter is a pretty exercise in marginal analysis, much indebted to Dunn

and Hoover. We are then shown that transport costs are not without relevance to the doctrine of comparative advantages and thus to International Trade Theory. The book finishes with a mathematical treatment (a little too elliptical) of the problems discussed and a geometrical chapter, which, as already mentioned, will be tough going for anyone who does not know this field pretty well already.

As Professor Isard (perhaps just a shade too frequently) remarks, the space dimension is much ignored in Anglo-Saxon literature, and there is little doubt that his book has much to teach us. In particular, it is a great relief to find that so much from our cosy little tool-kit will do quite nicely in this field. This pleasant fact may perhaps lead the reader to underestimate Professor Isard's contribution. A brief glance at the German literature or Professor Isard's summary of the theories of his predecessors, however, should quickly convince him that he has been lucky to find a guide who speaks his own language with such competence.

F. H. HAHN

*University of Birmingham.*

*International Economics* (Fourth Edition). By R. F. HARROD. (London: Nisbet and Cambridge University Press, 1957. Pp. xiv + 186. 8*s*. 6*d*.)

MR. HARROD has made some substantial changes in preparing the fourth edition of his justly famous text-book on international economics. The general framework of the book remains the same. The author first explains, on the basis of a classical comparative cost analysis, how international trade can enable gains to be made by the concentration of output in each country on the production of the products in which they have relative advantages. He then links up the comparative-cost theory with an analysis of the factors which determine the absolute level of money prices and costs in the trading countries. This leads to a description of the foreign-exchange markets and of the items in the balance of payments. Then the book is completed with a discussion of the " macro-economic " problems, that is to say, with the whole complex of interactions between wage-rates, exchange rates, levels of output and employment, and the balance of payments.

This progression from the " classical " to the " Keynesian " problems will commend itself to many teachers; and the new edition of Mr. Harrod's book provides one of the very few first-rate introductions to this last group of problems, to the solution of which he has in the past himself made important original contributions. His description of the possible conflict between policies for domestic equilibrium (for the preservation of full employment and the avoidance of inflation) and policies for external equilibrium (for a balance between international payments and receipts) is based upon an analysis of four possible situations in which a country may find itself: inflation or deflation at home with a deficit or surplus on the

balance of payments. From the distinctions which must be drawn between these four cases in the choice of policies the student can learn the basic elements of all the issues involved.

In reviewing the first edition of this book in this JOURNAL in 1934 Mr. A. W. Flux wrote: " Into a couple of hundred octavo pages [Mr. Harrod] crowds an astonishing amount of instruction in economic principles and of discussion regarding their application to practical problems." On reading the fourth and slightly shorter edition, this exactly expresses the feelings of the present reviewer—who, incidentally, has just completed a work covering the same ground in over 1,200 pages, of which Mr. Harrod, not unnaturally, wrote in this JOURNAL in June 1957 that " for the sophisticated reader it is undoubtedly laborious." But is it possible that there is somewhere a happy mean? There are a number of important topics (in particular, of commercial policy) which Mr. Harrod hardly, if at all, touches. What determines the height of the " optimum " tariff? Does the Most-Favoured-Nation clause stand in the way of tariff bargaining? What effect do tariffs have on the domestic distribution of income? Is there a special argument (such as the infant-industry argument) for the protection of industry in unindustrialised underdeveloped countries? Have subsidies to home production any advantages over tariffs or import restrictions for such purposes? Is a customs union a good thing (because it creates trade among the members) or a bad thing (because it diverts trade from outsiders)? Are there special circumstances in which it is desirable to use import restrictions on balance-of-payments grounds and, if so, should they be non-discriminatory? In view of Mr. Harrod's genius for succinct and lucid exposition of basic principles, the present reviewer greatly hopes that the fifth edition will run to 250 pages in order to include a fuller discussion of commercial policy.

J. E. MEADE

*Christ's College,*
*Cambridge.*

*Industry and Technical Progress.* By C. F. CARTER and B. R. WILLIAMS. (London: Oxford University Press, 1957. Pp. 244. 25*s*.)

THE task of writing this book has been deputed to Professors Carter and Williams by the Science and Industry Committee, set up by the joint sponsors of the research project, the British Association, the Royal Society of Arts and the Nuffield Foundation. The committee has itself taken an active part in the research, the aim of which is to identify the hindrances to the speedy application of science in British industry. One of the two full-time research units was housed in Belfast under Professor Carter and was responsible for all inquiries not involving visits to firms. The other unit, under Professor Williams, was housed at Keele and carried out case studies of over 250 firms. About 150 of these were " specific innovation "

studies; the remaining firms were visited in the course of "industry" studies. Four of these—those on pottery, cutlery, jute and paper—are summarised in an appendix. The authors are at pains to point out that this is only a first report, whose aim is to summarise their main conclusions.

The book deals first (Chapters 3–8) with the several stages in the application of knowledge, from basic research and the dissemination of its results to the decision to undertake full-scale production. With the brilliant exception of the short Chapter 4, which analyses the problem of communicating the results of basic research to those who can apply them in industry, this part of the book is somewhat lifeless. Too much of the discussion is taken up with the listing of relevant factors, mainly on the basis of common sense. Especially in Chapters 5, 6 and 7, on the readiness to use research and the results of research, there has been too little attempt to illustrate the points made by reference to the case studies, though this is not true of Chapter 8 on the decision to commit resources to full-scale production.

The second part of the book deals with the question whether Britain possesses the conditions necessary for the rapid adoption of new ideas—whether the supply of trained men or of money is adequate; whether the degree of competition in British industry encourages or hampers scientific advance. The discussion here is much better. Greater use is made of the case material, and there is less theorising and also less repetition. Few will quarrel with the conclusion that the degree of competition or monopoly in industry has had little influence on the application of science, and that this has not been markedly held back by a shortage of finance since the War. Nor would many deny the view that high tax rates have had little effect on the application of science, with the important exception that death duties often make it difficult for small firms to finance development from within. Indeed, the cynical may suggest that such obvious truths do not need proving in so great cost in time and money. The answer to this, of course, is that in economics it is often essential to give explicit proof to what, to many, seems merely the obvious. As the authors make clear (p. 7), many business-men who regard themselves as well informed (even, it seems, members of the Science and Industry Committee) sincerely believe that the "crushing weight of taxation," the "enervating influence of full employment" and the "excess of small firms" are the main obstacles to industrial advance. This authoritative analysis of such exaggerated claims —all too often the parrot cries of vested interest—can do nothing but good.

What does emerge from the report is that many of our failures in the use of science in industry are the direct result of inadequate training. In an outstandingly clear and able discussion supplemented by statistical evidence from the case studies (Chapter 9), the authors analyse the now familiar problem of how to obtain more qualified scientists. But there is a serious omission here in their failure to discuss methods of improving the quality of *management*, particularly since they conclude that, in their list of

the characteristics of the progressive firm, those " which relate to the quality of management . . . may be the most fundamental " (p. 188).

This is one of the crucial issues. It is surely wrong to argue as though good management is a gift of nature and that training is of no avail, even though at times the authors come near to implying just this. Training *does* help. But it is equally clear that training for management cannot be of the highest quality unless our universities are prepared to take a bigger share in it, as they already do in training for the law and for medicine. One can only hope that if Professors Carter and Williams agree that their report leads to this conclusion they will elaborate it in one of their further reports.

This is an exhaustive and authoritative study of one of the central problems of the British economy to-day, and it deserves a wide audience. Two minor criticisms seem worth making. First, while one cannot necessarily hold authors responsible for the dust-cover " blurb," this one contains the claim that the authors " cast doubts on a number of accepted points of economic theory." One wonders what these points are, since no obvious reference is made to them in the text. At a time when far too many economists are ready to attack it unjustifiably, such an imputation against " economic theory " needs substantiating in detail. The other point is this. On three occasions the authors deny that science and technology can be regarded as an " optional extra "; on another that they are an " optional gadget." One appreciates the authors' justifiable pride in such a telling phrase, but to use it four times in a mere 192 pages is surely overdoing it.

D. C. HAGUE

*University of Sheffield.*

*British and American Manufacturing Productivity.* By M. FRANKEL. (Urbana, Illinois: Bureau of Economic and Business Research, University of Illinois, 1957. Pp. 130. $1.50.)

WITH the voluminous literature which has appeared in the years since the War on various aspects of Anglo-American productivity, one is apt to forget that the subject is by no means new: well before 1939, various academic economists, notably Taussig and Flux, were trying to explain why output per head in the United States manufacturing industry was more than twice as great as that of the United Kingdom. At the same time it might be argued that the institution of recent inquiries has been dictated more by a sense of practical urgency than that of academic interest. Thus studies ranging from inter-plant to inter-industry in context have been initiated not only to assess the extent of the disparity between United States and United Kingdom manufacturing productivity but also to establish in what respects the United Kingdom can profitably assimilate American technical and managerial practices. Mr. Frankel's study is a contribution of the first kind, is consolidatory and chiefly descriptive in character. His approach is to examine a number of the main variables influencing produc-

tivity and to correlate these with the differences in output per man year in individual industries. He is not concerned with explaining the causes of efficiency as such nor with assessing the extent to which the differences in Anglo-American productivity may be avoided; thus at the end of the book one is no wiser as to how Britain may reduce her productivity gap than at the beginning.

In Mr. Frankel's first chapters we are given a current assessment of Anglo-American productivity differences in thirty-four separate United Kingdom and United States manufacturing industries, the products of which are reasonably homogeneous. Using data derived from the United States Census of Manufactures for 1947 and the United Kingdom Census of Production for 1948, he derives a crude output per man year ratio of United States to United Kingdom productivity for those years of 2·44. This figure would appear to accord well with Rostas' earlier estimate of 2·2 for 1935–39, particularly when one recalls that during the interim period the average rate of productivity growth was 1·5% in the United States and 0·7% in the United Kingdom. In his examination of the causes of these differences Mr. Frankel adopts a two-fold approach: firstly, the *cross-sectional*, which "seeks to identify the chief factors responsible for observed productivity differences at a particular time and to evaluate their relative importance" (p. 11), and secondly, the *developmental*, the purpose of which is to assess the process of economic change as it affects productivity levels.

Concerning the former, four main variables—viz., resource conditions, plant and equipment differences, plant size and market size—are selected as important productivity determinants and a chapter devoted to an examination of each. In his choice, Mr. Frankel appears to have been guided by two criteria—first, the ability to reduce the variables to statistical terms, secondly, the relative importance of such variables as likely causes of Anglo-American productivity differences. There is, of course, something attractive about an approach which attempts to isolate and measure the significance of individual variables in the productivity function, but it is faced with two inherent difficulties neither of which Mr. Frankel completely surmounts, though he is obviously aware of their existence. One is the interdependence of the variables themselves; for example, plant size may influence productivity but is itself a function of market characteristics; the extent to which energy is used in industry reflects the resource endowments of the country and so on. The other is to establish which are the determinant elements in any causal relationship; for example, is productivity a function of the size of the market or is the converse true?

But perhaps a more serious weakness of Mr. Frankel's discussion—partly excusable by his first reason for selectivity, but not, I suspect, by his second—is the scant treatment he affords to management as a factor influencing productivity differences on the supply side. One rather feels

that whatever the relationship between the physical factors, it is important to probe behind these and take into account human considerations. It is true that the author does briefly refer to such questions in his final chapter, but his earlier analysis seems to be the poorer for an absence of their full discussion. As regards the variables which are analysed (three reflecting differences in the conditions of supply and one the conditions of demand), two are shown to have a definite—albeit a restricted—influence on productivity, whilst the significance of the other two is indeterminate. The market-size factor seems on first sight to be the most important single variable, but as the subsequent analysis is phrased in terms of the output of the industry and not that of the individual firm or plant, its practical significance is strictly limited.

In his concluding observations, which relate to economic expansion and productivity growth, Mr. Frankel attempts to project the future possible trends in United States and United Kingdom productivity. This provides an interesting theoretical exercise, as well as making quite clear, firstly, that the genesis of Anglo-American productivity differences dates back a very long way, and secondly, that save for some very unusual circumstances it is extremely unlikely that these differences in productivity will ever be reduced. Indeed, such evidence as is available would support the view that it will accumulate in favour of the United States with the possible United States/United Kingdom ratio in the year 2000 ranging from 3·04 to 3·75 according to assumed growth rates per annum. If there is a limiting factor likely to restrict the rate of United States productivity growth, it would seem to be that country's difficulty in maintaining an adequate rate of growth of raw-material imports.

The chief merits of this book lie in the factual presentation of the productivity statistics and a reasoned analytical account of the relative significance of certain variables. But its limited objective and selective coverage need to be constantly borne in mind. In fact, one is inclined to feel that the main value of Mr. Frankel's analysis is negative in character in that we do not know a great deal more than when we started except that we can better understand the reasons for our lack of knowledge. The implications for policy might also have been broached with profit. But the book reads well, and the author has a pleasant style and is lucid in expression: altogether its contents provide a very useful addition to the material available in this very complex subject.

J. H. Dunning

*Southampton.*

*The Conditions of Economic Progress.* By Colin Clark. 3rd Edition. (London: Macmillan, 1957. Pp. xv + 720. 70*s*.)

The first edition of this book was published in 1940 and ran to just over 500 pages. The second edition (completely rewritten and longer by nearly

100 pages) appeared in 1951. This third edition (largely rewritten) is more than 40% larger than the first edition in pages, but probably roughly twice its size in words and figures, because there are many larger tables and many pages of small-type notes.

Essentially it is still the same book. Erwin Rothbarth's review in the April 1941 edition of this JOURNAL would still be difficult to improve upon, although it would require a few minor changes of detail and a major change of emphasis to be equally applicable to the third edition. The minor changes would give the third edition an advantage over the first. This is because Mr. Clark has been able to take account of new research results. But the shift of emphasis required by a 1957 view-point is such that it cannot fail to be less favourable than the 1941 review, however friendly the reviewer.

In 1940 Mr. Clark was an innovator of great distinction, using his immense resources of energy and imagination in a neglected but important field. If the empirical study of economic growth is now the daily concern of an army of research workers he can claim no small part of the credit. But in this new context his pioneer work no longer appears as admirable and as stimulating. It is questionable whether his crude pioneering methods are justified at all to-day. The reckless statistical courage that was entirely appropriate to the first glorious sally hardly befits the massed advance on a broad front which is now in progress.

The fact is that Mr. Clark has not succeeded in digesting the enormous quantities of statistical material now available on the economic growth of nations. This is not surprising. It is amazing that he has been able even to take account of so much of it. But it is disappointing that anyone with as much accumulated knowledge and breadth of experience should have failed to limit himself to some part of the field in which he could make an effective analytical contribution.

What we have here, then, is the framework of the first edition expanded by the addition of the miscellaneous ideas, notes and tables acquired in more than fifteen years of keeping the original results up to date. It is a scrapbook of empirical research on economic growth, and like all diligently and intelligently compiled scrapbooks, it is a mine of interesting and suggestive items. Most active students in the field will be impelled to put it on their shelves in place of the second edition. But in spite of the addition of a list of tables, an index of people and a bibliography (which flouts all bibliographical conventions but is better than none at all), they will be maddened in this as in all previous editions by the unsystematic organisation and presentation of the material.

PHYLLIS DEANE

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*The Cotton Industry in Britain.* By R. Robson. (London: Macmillan, 1957. Pp. xx + 364. 60*s*.)

Although the cotton industry over the past hundred years (and before) must be one of the best-documented industries, there has been no reasonably comprehensive account of its organisation and problems since Chapman's *Lancashire Cotton Industry* published in 1904. At that time, cotton was our biggest export trade, and the industry still had a further ten years of expansion to come. Mr. Robson now presents us with an account of an industry which has been declining for something like forty years, and with an uncertain future. After a brief account of the processes of the industry and of its historical development (in which the decline is shown to be the almost inevitable consequence of the growth of industrialisation in the rest of the world: in the years 1910–13 Britain produced 20% of the world's output of cotton goods and exported 70% of world exports, the proportions now being 5 and 12% respectively) there are chapters on the following matters: location; specialisation of firms by products and processes; vertical integration; the size of factories and firms and their growth; prices, production and investment policy; collective regulation and government policy; and the future of the industry. The main omissions are the raw-cotton market (though this receives a little attention in the chapter on collective regulation) and the organisation of labour (touched on incidentally in other contexts, such as re-equipment and double-shift working).

Mr. Robson is Director of Statistics to the Cotton Board, and his immense knowledge of the subject is everywhere apparent. Apart from the chapter on collective regulation, the treatment is primarily statistical. There are, in fact, some 140 statistical tables in the text, occupying in total some sixty pages out of 300; there are also twenty-nine pages of statistics in an appendix (and ten other appendices on particular points). In consequence, it is not a very easy book to read, especially as the tables are not numbered, are scattered through the text in a way in which it is not always obvious where they fit in, and on one occasion at least the text refers to the "following" table when it seems to mean the "preceding." There are occasional numerical statements in the text which do not accord with the figures in the tables, and now and again Mr. Robson appears to be using a different, perhaps more comprehensive, table for his exposition than that which is in fact reproduced. Occasionally, too, the style is rather obscure, and Mr. Robson fails adequately to explain matters which are obvious to him but not to the uninitiated.

The treatment of some matters is perhaps over-elaborate. This is particularly so in the chapter on Location, in which there are sixteen full pages of tables, as well as some smaller tables, in thirty-three pages of text. One wonders, for example, if it was really necessary to give detailed figures of employment for each of the main sections of the industry, or of the output

of yarn by various counts, for every one of the cotton towns. For one reader at least, some interesting comments on the location of the industry tend to get lost in a mass of detail which is forgotten as soon as it is read. This is only an outstanding case in which it seems that the treatment has been influenced by the availability of statistical data rather than by the importance of the problem, and in which the statistician's enthusiasm could with advantage have been curbed (and possibly the price of the book made more moderate).

It is not, in fact, easy to get a clear general picture of the organisation of the industry. This is the more unfortunate in that Mr. Robson has many pertinent and illuminating things to say on specific topics. I should single out for special mention the discussion on the extent and rationale of specialisation; the analysis of the nature and advantages and disadvantages of vertical integration; the discussion of costs under different productive methods and the related problems of investment policy; the competitive position of cotton against man-made fibres; and the reflections on the future of the industry. Other readers will no doubt find other matters of equal interest.

The book must, however, be regarded as more of a work of reference for the reader who already knows something about the industry than a general survey for the student or general reader.

S. R. DENNISON

*Gonville and Caius College,*
*Cambridge.*

*American Industry and the European Immigrant, 1860–1885.* By CHARLOTTE ERICKSON. (Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1957. Pp. x + 269. 38*s*.)

THE study of European migration to the United States has gone through at least three stages. The first generation, pre-occupied by the problems of assimilation, were concerned with the adjustment of the immigrant within the United States; the second, nostalgic and ethnically self-conscious, followed the fortunes and cultural lags of particular ethnic groups; only recently has a third generation at last, with a degree of detachment, come to examine the character and causes of migration from " migrant yielding country " to destination. The pioneer work of Hansen has now been supplemented by statistical studies such as that by Brinley Thomas and by monographs of a more qualitative kind such as that of R. T. Berthoff on British industrial immigrants and now that of Charlotte Erickson on the recruitment of European immigrants for American industry.

Miss Erickson's chief concerns are the methods whereby European labour was recruited during the first intense period of industrialisation from 1860 to 1885, and the adjustment of the labour force to the influx. Drawing upon a wealth of primary immigrant sources, government reports and

newspapers, American, British and Scandinavian, she has brought light into a topic which abounds in murky and obscure places. Her most important discovery is that the contract labour law of 1864 did not result in bringing large numbers of European immigrants to work in American industry under contract, but that misconceptions about the importance of contract labour clouded the thinking of the American Unions in dealing with the immigrant problem.

It seems clear that after the contract labour law was passed in 1864 the efforts of the Commissioners of Immigration to regulate, and the American Emigrant Company to recruit, immigrants quickly broke down. Instead, industrial firms recruited some skilled workers privately; but even these firms made little use of the labour contract, relying instead on connections in the trade and through previous immigrants. In any case, American employers quickly wearied of the obstreperous character of the British skilled workman, especially in cotton textiles, and yearned to replace him with an unskilled, but more docile immigrant, tending a machine.

Unskilled labour was recruited in Europe, not under contract and not even by industrial concerns, but by steamships and railway companies looking for fares and by banks anxious to handle immigrant remittances and funds. This left a great void at the receiving end which was filled by private labour exchanges in the big cities. These recruited labour for profit on behalf of industrial firms. At this stage, if at all, were labour contracts entered into; and the employers' use of these labour agencies to obtain strike-breakers instilled a deepening resentment against immigrants. Strike-breaking was common among unskilled trades such as mining and railways; but the trade which, through its Local of the Knights of Labor, brought immigrant competition into politics and eventually forced a repeal of the contract labour law, was the window-glass workers, a tiny skilled trade threatened by the import of glass blowers from Belgium and Sunderland. Neither the Foran Act of 1885, which prohibited contract labour, nor the establishment of public labour exchanges, put an end to the conditions against which labour protested; and, in its frustration, the American Federation of Labor turned from practical measures to that general advocacy, on racial grounds, of wholesale restriction by quota, which was to become official policy. Such is the important, if somewhat intricate, story which Miss Erickson traces with skill and knowledge.

FRANK THISTLETHWAITE

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*Recruitment to Skilled Trades.* By GERTRUDE WILLIAMS. (London: Routledge & Kegan Paul, 1957. Pp. vii + 216. 23*s.*)

THIS book is based on an inquiry financed under the Conditional Aid Scheme for the use of Counterpart Funds. The object of the inquiry was to find the answer to a number of questions relating to recruitment for skilled trades and, in particular, to investigate the reasons for the continuing shortage of skilled workers.

The main source of recruiting and training workers for many skilled trades remains in this country, as it has been over the centuries, the institution of apprenticeship. Lady Williams, in this book, traces the historical development of that institution and describes its present nature. She examines its adequacy in the light of modern industrial and educational developments and finds it wasteful in its methods and inadequate to serve its purpose. She compares it with the arrangements in other industrial countries, and she makes various tentative suggestions as worthy of examination for its reform. She warns us that many of her inquiries were on too limited a scale for their results to have statistical accuracy, and she disclaims the practical experience of industry to enable her to make positive proposals. Nevertheless, she has made out a convincing case well worthy of serious examination by industrial interests and educational authorities. It appears that such examination is likely as a result of a report approved, since this book was published, by the Minister of Labour's National Joint Advisory Council and subsequently published.

Important conclusions deriving from the inquiry are that shortage of skilled workers in the industries examined is not, except in shipbuilding and printing, primarily the result of trade-union limitation of the number of apprentices, or of lack of boys willing to enter on apprenticeship, but rather of unwillingness of many firms—usually, but not always, the smaller firms—to undertake the burden of taking apprentices, and the lack of adequate training facilities offered by most of the firms which do take them. This leads the author to examine various possibilities for linking the responsibility for training less with the individual firm and more with the educational system and with the industry.

With regard to the length of training and the age at which it takes place, Lady Williams suggests reconsideration of the rigid requirements of an apprenticeship commencing at the age of fifteen or sixteen and lasting five or six years, which seem to have no basis but a long history and no relationship to the nature or degree of skill to be acquired. Relaxation of such requirements and revised methods of training would reduce the time occupied in training and widen the entry to include adult apprentices and youths who, before entering on apprenticeship, have had the advantage of grammar-school education.

So far as formal teaching of their craft is concerned, this is almost

entirely confined to such of the apprentices as attend, either voluntarily or as a condition of their apprenticeship, either during day release from their employment or after working hours, the courses provided at technical colleges. In this connection Lady Williams produces some rather startling figures as the result of her search of the registers of a number of technical colleges. From these it would appear that the big majority of the apprentices fail, even after repeated attempts, to pass even the Intermediate Examination, which is only a stepping-stone on the way to the Final Examination supposed to represent the level required of the skilled craftsman. This leads the author to inquire whether the fault lies in the quality of the instruction at technical colleges, the capacity of the students or the standard of the examinations. She finds a partial answer in each. Technical colleges, like other educational institutions, have their staffing problems, and some peculiarly of their own. The present general requirement that apprenticeship should start at fifteen or sixteen deprives industry, so far as craftsmen are concerned, of many of the increasing number of intelligent boys who now have the opportunity of grammar-school education. It might also have been added that the increasing demand for scientists, technologists and technicians, and the increasing opportunities to train as such, reduce the sources from which the intelligent skilled craftsmen can be drawn. The opinion of industry, however, to which Lady Williams draws attention, that many of those who fail dismally in the technical college examination make adequate and satisfactory craftsmen does suggest that these examinations, as a test of competency for a skilled craft, are of a totally wrong standard.

This, in turn, leads on to the further suggestion that a reasonable test of competence, rather than a rigid length of apprenticeship, might well be the certificate of craftsmanship and would provide a system more suited to the diverse degrees and types of skill required in modern industry.

H. S. KIRKALDY

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*The Wages Councils System in Great Britain.* By C. W. GUILLEBAUD. An Economic Monograph. (London: James Nisbet, 1958. Pp. 31. 2*s.* 6*d.*)

THIS small monograph is important for two reasons. First, because its author is one of our most experienced arbitrators. Second, because legal wage-fixing machinery, despite the immense growth of voluntary collective bargaining, now covers a remarkably large proportion of British wage-earners, estimated by Mr. Guillebaud at about one-fifth, some four million workers being under statutory wage-orders. But of our twenty-odd million employed people, nearly a third are salaried, so the proportion of wage-earners proper is probably higher.

It does not pretend to be the complete survey that the remarkable later

development of the old Trade Board now perhaps calls for. It includes a useful and terse account of the history and legal position of the modern Wages Councils and their allied Wage-Boards, as well as a description of the procedure for their establishment, of their composition, powers and functions, and of the method by which their proposals are confirmed and enforced. But their nature does not fully appear from a formal description. Structurally, the Wages Councils appear to be a rather uncertain mixture of state wage-fixing, independent arbitration and collective bargaining. The greatest value of Mr. Guillebaud's account is thus the picture it gives of the role of the "independent members"—a picture that draws realism from his own distinguished service in that capacity. The device of the independent member, in fact, gives the Wages Council system a flexibility which is hidden by its surrounding legal formality. In practice, the independent members may play the part of arbitrators, mediators or mere ratifiers of agreements already made, as the circumstances of their particular Council dictate. By contrast, the power of the responsible Minister, which seems formidable in law, has been little exercised, and that only in minor matters.

Mr. Guillebaud's final assessment, however, is that ". . . the Wages Councils system has achieved the general purpose for which it was established." There is no doubt that it has largely eliminated "sweating." And that it has had the incidental effects of compelling less-efficient employers to improve their use of labour, and of reducing extreme inequalities in wages, can also be well argued—though Mr. Guillebaud does remark on the tendency of Wages Council rates to fall behind others in more recent years (a tendency which also suggests the indirect, if not the direct, effect of government policy on legal wage-decisions to be greater than he implies). But the motive for extending the legal wage-system so far *beyond* the old "sweated trades" was primarily to provide a form *transitional* to independent collective bargaining. And one can hardly judge this purpose fulfilled when—as has in fact occurred—the system has become so solid, extensive and apparently permanent.

Mr. Guillebaud states the orthodox union criticism of the system—that it deters trade-union recruitment and handicaps union claims for higher wages. But this criticism contrasts oddly with the unions' obvious reluctance to see the system's scope diminished—indeed, with their not infrequent pressure for extensions of it. One suspects, in fact, that the unions' criticism conceals (and excuses) their leaders' finding that it is easier to rely on legal support than to establish their bargaining position by organising campaigns. To a great degree, the Wages Councils system now provides an instrument for larger employers and minority unions to impose their own terms on the unorganised and unrepresented.

There may be a case, in some industries, for collective agreements to be legally enforced. But that does not require such elaborate indirect and

expensive machinery as the Wages Councils system: quite simple procedures, for instance, are already provided by the Industrial Disputes Order and the Cotton Manufacturing Act. Or if, to permit smaller employers to survive, a dual wage-rate system is desirable, a simple National Minimum Wage could be arranged to supplement collective agreements. But if unions (and employers' federations) insist in practice on maintaining the present legal-wage machine in all its elaboration, then there is nothing to justify the parallel maintenance of government non-intervention in the machine's wage policy. Official neutrality was originally designed to encourage independence; it arose from the supposition that the legal wage-boards were transitional. But if the State is to bear the permanent expense of maintaining wages in such detail and over so wide a field it cannot reasonably be argued that it should have no say in what those wages should be.

H. A. TURNER

*University of Manchester.*

*The Measurement and Behaviour of Unemployment.* A Conference of the Universities–National Bureau Committee for Economic Research. (Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1957. Pp. 605. 60*s*.)

THE American recession of 1949 set off a controversy about the actual degree of unemployment in the United States that was stimulated when the 1940 and 1950 census returns made available new comparisons with then existing labour force data. This collection of papers is a major product of that discussion, and much of it will have an enduring value.

In Britain little recent attention has been paid to the measurement of employment and unemployment. With an unemployed registration usually below 2% of " employees," full employment has been assumed virtually continuous. Such things as the 1951 Census of Population's return of over twice the number " out-of-work " reported by the Ministry of Labour, or certain occasional but curious discrepancies in our labour-force statistics (and between them and other indices of activity) have passed without much comment—though a certain distrust of the unemployment index has become evident in some commentators' tendency to rely more upon such other data as returns of short-time working or of vacancies.

One reason for a re-examination of this question is the possibility of a new recession. And a study of our labour force data's recent behaviour suggests that British unemployment indices may very seriously under-state a decline of activity, especially at just that early stage of a stiff recession when counter-action should be launched if it is to be effective. Another reason, however, is the attempt implied in much recent discussion (and

policy) to re-define " full employment." And if new definitions are to be given, we had better know whether they have a measurable meaning.

Most of the papers in this Universities–National Bureau collection are, of course, much concerned with its national background. An apparently higher level of unemployment makes the latter's American character rather different from that recently experienced in the United Kingdom, and our sources and categories of unemployment information are not at all alike. Otherwise these papers leave two worthwhile impressions. First, of how fast the accuracy of a national statistic accepted by foreigners as authoritative (and American unemployment indices are technically rather superior to our own) disappears under close domestic scrutiny. And second, of how much short-term comparisons between countries must reflect their differing statistical methods rather than their respective economic situations.

Two papers, however, will be of very general value. Mr. Albert Rees' introductory to the Report's first section on the meaning and measurement of full employment is an outstanding critique of the standards that have been suggested—Beveridge's " verbal " and " numerical " definitions, price stability and so on, but his conclusion that no single rule (or technique of measurement) is adequate to the problem's complexities will not satisfy popular demand for a ready test both of paid work's availability and of the effectiveness of government policy. Between that demand, and the expert's desire for completeness and detail in measurement and discretion in judgement, some compromise must be found if public policy and statistics are to inspire any wider confidence.

In the collection's second part—on the behaviour of unemployment—there is a most impressive and useful examination of unemployment trends in nine Western Countries (which includes the United Kingdom, but excludes the United States) by Messrs. Walter Galenson and Arnold Zellner. Their analysis extends back to around this century's opening, and since several of the earlier series come from similar sources—trade-union returns particularly—they provide a very reasonable degree of comparability. Moreover, they do not seem particularly out of line with later series, derived from more official sources.

The results present a broad picture of the inter-war period as a startling but transitory relapse from normal high employment; but the paper also includes much valuable discussion and comparison of national sources and situations.

It is interesting that this collection should have so little to say on what, for the United Kingdom and quite a number of other countries, have become the most important phenomena of recent employment fluctuations. Both Mr. R. C. Wilcox (under the convenient title of " the secondary labour force ") and Miss Gertrude Bancroft remark on the problems created by the labour market's enlarged " fringe " of workers, like married women, pensioners and so on. But the effect does not seem as significant to them as

it would be to us. The problem of under-employment (which occupied the I.L.O.'s recent Ninth Conference of Labour Statisticians) is treated at length only in relation to rural areas. Here, the discussion of Mr. L. J. Ducoff and Miss Margaret Hagood may have a bearing on the labour issue in under-developed countries. But the whole question of "work-sharing," which has become in several industrial nations the major reaction to economic recession, is barely touched on. This form of unemployment is particularly responsible for the British index's current inadequacy. And only some variant of what Professor Rees calls the "maximum employment" concept seems capable of dealing with it.

H. A. TURNER

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*The Labour Movement in the Sudan, 1946–1955.* By SAAD ED DIN FAWZI. (London: Oxford University Press for the Royal Institute of International Affairs, 1957. Pp. xiv + 175. 25*s*.)

IN newly developing countries such as the Sudan a major problem is the extent to which the economic and social experience, legislation and practices of advanced countries can be usefully applied. Among the issues raised in Dr. Fawzi's book are whether, except in a few industries, economic conditions in the Sudan are favourable for the establishment of a strong, responsible trade-union movement, and how in such conditions industrial relations should be regulated. Predominantly the population is engaged in peasant subsistence farming. Hired labour in agriculture, including cotton cultivation in the Gezira, is mainly seasonal. Only about 8% of the population live in towns. The Government is the biggest employer of wage-earning labour, and in private industry employers with considerable numbers of workers tend to follow the Government's lead in wages and working conditions. Also, until self-government was attained in January 1954 the Government was alien.

Dr. Fawzi's survey, published under the auspices of the Royal Institute of International Affairs as the first of a series of monographs on modern society in the Middle East, reviews objectively the political activities of the Sudan trade unions during the struggle for independence, as well as their industrial policies. In 1946 the Government proposed the formation of works councils or joint consultative advisory committees in government departments and private industry as "the basis on which trade unions could subsequently be set up on sound prepared lines" (p. 32). About the same time a Workers' Affairs Association was established, and it demanded recognition and the development of trade unionism. The Association, which was formed by artisans in the Mechanical Department of the Sudan Railways and became the spearhead of the trade-union movement, was hostile to the works council proposal, regarding it as a device by management to obstruct the growth of trade unions. The Association

became increasingly aggressive and anti-imperialist, and in 1947 succeeded in winning recognition by strike action. Impatient of delays, it did not recognise sufficiently the time involved in making governmental decisions on policy and in preparing legislation. On its side the Government did not take enough account of the inexperience of the workers' leaders, and of the urgency to them of remedies for low wages and other genuine grievances.

After the enactment of trade-union legislation in 1949 the Workers' Affairs Association was changed into the Sudan Railway Workers' Union, and unions were rapidly formed in other government departments and in private industry. The trade-union movement is still in its formative stage, with many signs of " mushroom " growth. Dr. Fawzi gives a list of about 130 unions, their total membership being only about 100,000, or little more than 1% of the population. Paramount is the Sudan Railway Workers' Union with about 25,000 members. Among the others a few have 1,000 to 1,500 members each, but the average membership is only about 600. Many are unions of workers in government departments, while in private industry they are often organisations of workers employed by individual companies. Trade unionism is insignificant outside the urban centres, and plays little part in Southern Sudan. Almost half of the unions are only spasmodically active.

Most of the unions became affiliated with the Sudan Workers' Trade Union Federation, which was formed in 1950 under the leadership of the railway workers. It started in a militant mood, brought the trade unions into the nationalist movement, claimed that the imperialist government was the main obstacle to the workers' efforts to improve their conditions, and the Federation organised a series of general strikes mainly to secure wage increases. It even opposed the Anglo-Egyptian Agreement of February 1953 by which the Sudan could achieve early self-determination. It showed communist sympathies and hostility to the International Confederation of Free Trade Unions, which its President described as an imperialist agency for weakening the will to struggle of the workers generally and colonial workers in particular. It remained militant after Sudan independence, its prestige declined from 1953 largely because its political policies were not supported by many workers, and it was greatly weakened when in 1956 the Sudan Railway Workers' Union and several other unions of workers in government service withdrew from it.

The coming of self-government has not changed the fundamentals of industrial relations. Wage standards are still limited, as everywhere, by productivity, and the Government is still the biggest employer. Many questions remain for solution. One is whether the trade unions will show increasing responsibility in collective bargaining and make less use of the strike weapon. A related question is whether compulsory arbitration should be adopted, as in India, Burma and Pakistan, for settling disputes in essential industries and government services, or whether, as the author prefers,

voluntary arbitration should be retained. Already before independence various wage anomalies had been removed, particularly the previous unduly wide differentials between clerical workers and skilled artisans and unskilled labourers. Also comprehensive legislation based in British experience was enacted to regulate trade unions, industrial relations, conciliation and arbitration. This legislation was misunderstood and opposed by the trade unions; yet after it had been in operation for several years the unions became so favourable to it that they regard it as essential for their freedoms and would strongly object to any tampering with it.

Dr. Fawzi's study is of value not only for the systematic account it gives of trade-union development in the Sudan, but also because, as Professor Phelps Brown indicates in a Foreword, the problems raised are common to many underdeveloped countries wherever there is impact of industrialisation and emergence of wage-earning labour in primitive economies.

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*Cities in Flood.* By Peter Self. (London: Faber & Faber, 1957. Pp. 189. 21*s.*)

As the old depressed areas become " developed " and show (except for Northern Ireland) employment almost as full as the rest of the country, the other problem which the Barlow Commission considered pressing—urban congestion—comes to the fore. A book reviewing the present position of Britain's great cities is therefore very welcome. As the title and " blurb " of Mr. Self's book suggest, these cities are once again " at the flood "—striving to burst the dykes which have been dug to stop them spreading endlessly across the countryside. This theme is developed fairly systematically by Mr. Self. His first two chapters deal with the features that form the precise problem of the conurbations such as " lack of sunlight, privacy and opportunities for recreation " (p. 27) in the centre, and " nightmare " (p. 26) journeys to work from the sprawling suburbs. By thus affecting the health of workers and by the delays of traffic jams in the transport of goods, conurbations can certainly have high economic costs marked against them. The later chapters deal with policies hitherto pursued or proposed, to avoid—or at least to modify—these features. Here recent experience has often been discouraging. Attempts at redevelopment of the central areas have come up against " the very high cost of flat construction " which " is perhaps the greatest of the many mysteries of the British building trades " (p. 44). But even if the number of flats planned are actually built, not all the population can be rehoused in their original habitat. The policy next in line is therefore " overspill " of some of the central city inhabitants, and any additional population, into areas surrounding the city.

To avoid the continuous sprawl of subtopia, overspill is planned beyond

a green belt either into existing small towns or into New Towns. Mr. Self cites certain exceptions (pp. 68–74), but small town authorities have on the whole not been very keen to build the necessary houses, and attendant streets, sewage and other works on the terms offered by the large cities and the central government. The New Towns, where houses are allocated in the main only to those who are assured of a job in the town itself, have proved on the whole quite attractive to industries, and the towns already started appear likely to show a profit in the long run. But the Government's anti-inflation policy has for the present prevented more being started, and no sites have as yet been designated round Birmingham, though, as the author says (p. 25), the West Midlands was the only conurbation to grow substantially between 1931 and 1951.

Mr. Self is by no means a " long-haired " planner riding roughshod over economic considerations, and under the heading of " The Economic Equation " he asks (p. 30) how far it is economically wise or feasible to interfere with the natural growth of industry and commerce in and around the big centres of employment. If anything, he is a little too respectful to natural forces (and the entrepreneur's wisdom) in enlarging conurbations. It is true that a big conurbation can combine the economic advantages in efficiency and security of localising *several* industries. But it does not follow that all the industries actually found in a conurbation are necessary to its continued prosperity. Under the title (Chapter Six) of Jobs on the Move, Mr. Self discusses the success of the Government's development-area policy and rightly draws attention (p. 31) to the West Midland Group's list of industries (given in Chapter Eight of their *Conurbation*) which should operate equally well in places other than the Birmingham conurbation. Such self-denying lists should in fact be worked out in other conurbations and, if acted upon, might form the positive solution to the purely negative restriction of the Green Belt.

In conclusion, it should be said that Mr. Self's book will be found particularly useful in its summing up (pp. 149–64) of the principles, complications and implications involved in the legislation from 1945 to 1954, and of the clashes (p. 139) between development and decongestion policy (Merseyside and Glasgow are both congested as well as development areas) and between (p. 111) the agricultural and housing-plus-horticultural uses of land. Economists will find Mr. Self a most intelligent guide through the legal and political maze.

P. Sargant Florence

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*Capital Formation in Residential Real Estate: Trends and Prospects.* By L. GREBLER, D. M. BLANK and L. WINNICK. (Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research, 1956 (London: Oxford University Press, 1957). Pp. 519. 80*s*.)

THIS monograph is the first of a new series on long-term trends in capital formation in the United States, and it reviews the course of private residential construction there since 1889. The sources of the capital funds invested in residential construction are also examined, and in a final section the long-term prospects of the residential construction market are discussed. No study of house-building has ever been completed for so long a period in such detail before, and this contribution merits the highest praise, if only for its attempt to assemble the basic facts on residential building expenditures and on appropriate cost indices.

One of the main purposes of the book, as of others in the series yet to be published, is to discover what light past long-term trends in capital formation may shed on future prospects. The section in the present study appraising long-term prospects happens to be one of the least conclusive of the authors' contributions to this field of inquiry, but they give convincing reasons for their caution in extrapolating past trends into the future. They emphasise, for instance, that while a basic long-term relationship between increase in population and net additions to housing stock can be shown to have existed, it has been a relationship of great complexity (p. 267 and Chapter V *passim*). A potential maximum of 55 million non-farm households deducible from population analysis accommodated itself in 37 million *actual* households in 1950. Furthermore, population projections are in any case unreliable, for well-known reasons (the authors make an approving reference to Joseph S. Davis's somewhat sardonic commentaries on past population projections applied to the United States). The authors are cautious about the future role of government, in regard to credit aids or to public housing, and about the significance to be attached to the long cycles in residential construction, two of which have been shown in their descriptive work to have been associated with world wars (p. 303 and Chapter III). (There have been three such cycles with peaks in 1890, 1905–9, 1925 and 1950.) Allowing for all these uncertainties, their view is that, from about 1954 onwards, the pressure on housing is to be expected to diminish for at least ten years, during which period some types of non-residential construction may increase (p. 305), and that the federal government is likely to be somewhat liberal in its credit policies if this period of easier demand shows signs of causing a severe fluctuation (p. 306). After this period, renewed housing "need" may be expected to reassert its influence.

The limited character of these conclusions is imposed upon the authors by the character of their investigation, which, as Professor Kuznets empha-

sises in a Foreword, was directed to examining long-term trends rather than fluctuations and their causes. It is, perhaps, the greatest merit of this volume that it sets out those trends with such clarity. For example, the authors bring out the point that in 1929 prices the average private non-farm dwelling built in 1890 cost about $6,000, while in 1953 the average was only about $4,000 (for the period 1946–53 an average of $3,800). They examine possible changes in the physical characteristics, equipment, facilities and size of dwelling units which may help to account for this fall, and they pursue this problem into a discussion, to which a whole chapter is devoted, of a possible weakening in consumers' preference for dwellings as against other goods. " The doubling of real family income that has occurred since about 1890 suggests, therefore, that the real value of a new dwelling unit should have increased, rather than decreased, by 40 per cent " (p. 126). Relative prices have undoubtedly moved against residential expenditure. Borrowing an estimated price elasticity of demand from Duesenberry and Kistin, the authors allow that relative price movements may account for about one-tenth of the change in expenditure per unit, but argue that there is still a residual shift to be accounted for by preference changes.

These, and other fascinating topics, are touched on, rather than definitively settled, in this interesting and comprehensive monograph. The definitive contribution of the book largely consists of well-presented basic statistical tables, some of them in the lengthy appendices which occupy two-fifths of the volume. Most of these tables have been derived or adjusted from earlier published material (the cost indices from the *Engineering News-Record* series and from Colean and Newcomb's book on *Stabilizing Construction*, and the finance estimates from Raymond Goldsmith's publications, for example); nevertheless, it is of great convenience to have this information assembled and arranged for the specific purpose of studying the residential construction market. The book is bound to become a work of reference for the special facilities that it provides, including regional analyses both of residential activity and of types of finance employed, and at the same time a work of introduction to the economics of residential construction in the United States.

IAN BOWEN

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*Estate Capital.* By D. R. DENMAN. (London: Allen & Unwin, 1957. Pp. 218. 22*s.* 6*d.*)

THIS work is a write-up of four surveys of agricultural estates carried out by the Department of Estate Management of Cambridge University. The amount of investment in fixed equipment and land improvements is the centre of interest and the surveys obtained figures of the amount spent in recent years. For each farm on each estate requirements of further invest-

ment " were recorded item by item, as both the landowner and tenant described them. Details were obtained of external funds supporting the estates. Enquiries were made concerning the restraints that check the investment of these resources in fixed equipment and land improvement. . . . Details of mortgages, loans and other charges were noted " and other information was obtained. Furthermore, what the author calls the " character traits " of the estates were recorded. These include size, whether compact or scattered, type of farming, whether tenant or owner-occupied, whether the owner's title was recent, whether estate duty had been suffered or not, whether the owners were subject to surtax and several other factors.

The author is primarily interested in ascertaining three main groups of facts and discovering how they are associated with the various " character traits " of the estates. The first of the three relates to the extent to which estate income has sufficed to cover expenditure on improvements over a period of years. This is rather curiously described as " competence," although, as the author indicates, complete competence may reflect either a high income or low expenditure. It appears that of 133 tenanted estates, 45% were wholly incompetent to form estate capital from estate income, which presumably means that estate income was zero! The relationship between competence and various character traits is examined: it appears, for example, to be the same for scattered as for compact estates and lower for estates whose owners are subject to surtax than for those whose owners are not.

The second group of facts examined is the extent and composition of other wealth owned by estate owners. Such capital could be used to finance improvements to the estate. Figures giving the ratio of other capital to the value of estates are given by size class of estate, and the relation between this ratio and various character traits is also examined.

Thirdly, figures are presented showing the deficiency in physical terms of equipment and land improvements as compared with what the landowners deem to be desirable. There are also some figures of the cost (at current prices) of improvements undertaken over the ten years preceding the survey in comparison with the cost of meeting present wants. Unfortunately the meaning, and hence the significance, of all these figures is extremely obscure. " Deficiencies," we are told, " are matters of opinion." But even if all the respondents had the same standards, so that the figures for different estates represented a uniform opinion of " need," the author's explanation of the figures is too inadequate for their meaning to be apparent. If a farm with three barns " needs " a fourth, the percentage deficiency is 25%, while if a farm with no barn needs one the deficiency is 100%. This seems simple. But only one other explanatory example of " percentage deficiency " is given, and this shows how arbitrary the procedure is; we are told that perfection in water supply means a mains supply and that " a cottage or farmhouse with well water piped to the premises is looked upon

as 50% deficient." The author computes figures " for general percentage deficiency " by weighting deficiency percentage in items of first consequence for efficient production more heavily than those of less consequence. But there is no explanation of which items are of what consequence, and nor are the weights stated. All these inadequacies make the statement (in Table IX) that the percentage deficiency in general for estates of, *e.g.*, 100–249 acres was 7·06% utterly meaningless. One can only hope that few scarce resources were used in obtaining these figures.

Unfortunately statistical amateurishness, including totally inadequate exposition of the procedures followed, is not confined to the section just discussed but pervades the whole book. We are solemnly told that in "6½% of the opinion " (p. 118) of thirty-seven (p. 114) landowners the estate-duty concessions on agricultural property constituted an inducement to improvement. And a diagram showing the relative frequency of various factors restraining rent increases includes one factor, " Rates Relief," which was apparently operative only in Scotland, yet the diagram relates to Britain, and the proportion of Scottish estates is not stated!

These two examples are minor matters. A major matter is the question of whether the Main Sample of 224 estates (a quota sample derived from the 11% effective response from a field of 12,400 estates selected in some unspecified manner) provides results which reflect the population of estates as a whole. Mr. Denman does not discuss this point, and one wonders whether, at any stage during the research, he took the obvious step of consulting a statistician.

These drawbacks are not outweighed by the presence of any economic analysis. Various interesting problems are raised, such as the effects of taxation on investment in improvements and the obstacles to increases in farm rents, but they are not set out and discussed properly. There are an occasional stimulus to thought and some useful pieces of information, but the book has little to offer so far as economists are concerned.

RALPH TURVEY

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*The Gold Coast Cocoa Farmer.* By POLLY HILL. (London: Oxford University Press, 1957. Pp. 140. 16*s.*)

IT is difficult for those who have never carried out any field-work economic research in under-developed areas to understand the innumerable special difficulties that have to be faced. Limitations on time and money are accentuated by problems of suitable accommodation in remote areas, transport over long distances and bad roads and the low educational standards of available assistants. The research worker even finds frequently that he has to abandon his original intentions of scientific random sampling, as this leads him to suspicious villages and hostile informants. More fundamental is that he finds no one who really knows much about the

constituents of the aggregates which he is hoping to determine. He then turns, like the anthropologist before him, to case studies of places and persons, where he can be introduced by some sympathetic intermediary. Though well aware of the possible biases, he hopes that he may gain a clearer idea of the problem and perhaps the order of magnitude of the quantitative data he is seeking.

Miss Hill's recent work has been exploratory, and though, as she says, the figures collected may be useful in themselves, they are intended to be more of a peg on which to hang further inquiries. *The Gold Coast Cocoa Farmer* is largely concerned with two topics—the systems of employing labour on cocoa farms in Ghana and the pledging of the farms. In this study Miss Hill obtained the assistance of the Ghana co-operative movement, which handles one-fifth of all Ghana cocoa, and restricted her inquiries to its members, who are reasonably representative of all Ghana cocoa farmers.

The two most common systems of employing labour are the *abusa* system, under which the labourer receives one-third of the crop for his work, and the *nkototuano* system, under which he receives a fixed sum for each load of 60 lb. that he harvests. Under both systems the labourer does virtually all the work on the farm. This is inevitable where one man commonly possesses several cocoa plots, sometimes many miles apart, so that he is largely an absentee landlord. We need to know very much more about the precise relationships between the owners and the labourers and the variations from area to area. It is known that black-pod disease and capsids destroy much Ghana cocoa, but it is not clear whether the owner or the labourer takes the initiative in disease control. More important still, it would seem that the effective cocoa price from the incentive point of view may be the portion received by the labourer. In the case of the *abusa* system it is only one-third of the official buying price and not the full amount. Price incentives need to be examined afresh in this context.

If little is known about systems of employing labour, still less is known about the extent or even the nature of pledging or mortgaging of cocoa farms. A variety of legal fictions have sprung up in an attempt to reconcile the traditional principles with modern economic needs. One of these principles, still for the most part observed, was that land needed for the present and future maintenance of the family group must not be alienated; the modern pressure of economic necessity and advantage suggests to many individuals and groups that land should be converted into money. Uncertainty in this transition period is shown in many farms being mortgaged in circumstances which in European countries would have resulted in a sale of all or part of the farm. If outright selling had been the practice the condition of apparent heavy indebtedness would not have existed.

Interest rates appear to Europeans to be very high—50 or 100% usually being quoted—but as the time of payment of the interest is very elastic, it seems that the actual charges are often much exaggerated. Indeed, the

terms on which money is lent are often so vague that even the two parties to the transaction are sometimes uncertain of them. Miss Hill found, as others found amongst the cocoa farmers in Western Nigeria, that most of the creditors were farmers living in the same area as their debtors, many being close relatives or friends. Middlemen in the cocoa trade formed an important though small group of creditors, but very few professional money-lenders lent direct to farmers. The reasons for pledging farms are concerned almost entirely with non-agricultural purposes, such as building, transport, litigation, education and medical expenses. The provision of credit for agricultural purposes has very little to do with the redemption of pledged farms.

In throwing light on the meaning of such terms as "farmer" or "indebtedness" in the Ghana context, this book illustrates how misleading it can be to apply Western terms and concepts to the less-developed countries without a clear idea of their local social and institutional backgrounds. It opens up a number of lines for future research, and it is perturbing to find how little is really known about matters so often accepted without discussion.

K. D. S. BALDWIN

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*English Overseas Trade during the Centuries of Emergence.* By G. D. RAMSAY. (London: Macmillan, 1957. Pp. x + 279. 30*s.*)

It is fifteen years since the publication of Mr. Ramsay's scholarly study of the Wiltshire woollen industry in the sixteenth and seventeenth centuries. Now the same author gives us that rare kind of book, a general review of an extensive topic, covering a fairly long period of time, written by an expert in one part of the field. The result is a book of quite unusual clarity and readability, and of sustained excellence.

The "centuries of emergence" are the sixteenth and the seventeenth, although what Mr. Ramsay has to say is not confined to these two. The book consists of seven chapters or essays which can be read independently of one another but which unite to form a well-balanced and complete picture of English foreign trade in the period. Perhaps the most interesting to the economist are the first, dealing with the rise of London and Antwerp; the third, dealing with the struggle of English merchants to establish themselves in the Indian Ocean; and the fifth, describing the interdependence of England's Atlantic and European trades in the seventeenth century. It is disappointing that here and there important economic questions remain unanswered—for example, how was enterprise so quickly effective in fifteenth-century Antwerp despite its natural disadvantages? and just what lay behind "the overexpansion of the cloth industry" in England in the fifteen-forties?—but it may be that the obscurity of a remote past now

makes these questions unanswerable in terms which a present-day economist would accept.

The outstanding merits of the book are two. In the first place, there is its lucidity. The sequence of events, the character of different trades, the policies of governments and of commercial organisations—all are complex and are shown in their complexity, and yet without confusion. And this achievement is all the greater, and the more important, because the second merit of the book is the way in which there are brought together both the political and the economic causes of change. Thus Mr. Ramsay shows how the impulse to find new markets in the Baltic, the Mediterranean and across the Atlantic became effective only after the trade difficulties of the fifteen-fifties had undermined confidence in the future of the Antwerp market, and reluctance to give offence to the Hapsburg family had evaporated with the accession of Elizabeth I in 1558. A combination of political and economic causes seems likewise to account for the triumph of the Dutch in the East Indies in the seventeenth century, " probably the greatest commercial setback suffered [by England] between the making of the Utrecht agreement with the Hanseatic League in 1474 and the revolt of the American colonies three centuries later " (p. 70).

This combining of economic and political motives naturally makes the trade wars of the seventeenth and eighteenth centuries far more intelligible than they usually seem. And in this connection it is striking to notice the significance of another factor upon which Mr. Ramsay does not dwell, namely, the armaments trade. There was an important armaments market in Antwerp before 1500. English tin—" a much-prized commodity in the war-ridden Mediterranean "—was wanted chiefly for casting bronze cannon, and the Barbary and Guinea trade was in part an exchange of timber and other English shipbuilding materials for saltpetre, the chief ingredient of gunpowder. In more ways than one war and trade were never far separated in those centuries, and economic progress, which was always going on at a pace which is perhaps often underestimated, can be seen as at once the counterpart and the result of the gradual imposition of order upon chaos.

Mr. Ramsay modestly disclaims originality for almost all that he has written; he has " relied wherever possible upon authoritative secondary sources." He gives, however, " A Commentary on the Authorities," which is itself almost in the nature of an original contribution to knowledge. And his seven chapters, even if properly described as a work of synthesis, are at once a greater achievement and a more valuable contribution than many a monograph.

A. J. YOUNGSON

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*Ruskin and the Economists.* By J. T. Fain. (Nashville: Vanderbilt University Press, 1956. Pp. 164. $4.00.)

This slim volume by the Professor of English at the University of Florida gives a useful critical introduction to Ruskin's views of economics. The subject has been neglected since J. A. Hobson took over many of Ruskin's views; it is not an unimportant one, however, for Ruskin's attack on classical economics had considerable influence in Victorian England, and some of his more positive ideas are worth examining even to-day.

Ruskin never read any books on economics, except Adam Smith (" did they suppose I got my knowledge of art by reading books? "), but he had gleaned enough ideas from browsing and from conversation to form the opinion that the " science of orthodox political economy " was " a lie—wholly and to the very root." It was scornful of religion; it professed to be a science of human relations, and yet it abstracted from Man all his truly human characteristics; it was concerned only with one phase in human history, " the phase of modern commercial operations "; it provided the wrong recipes for national economic policy. In none of these charges was Ruskin original, and in none of them did he try to be fair to his opponents. As Professor Fain suggests, he made no attempt to distinguish between different kinds of " orthodox " political economists, he gave the same treatment to academic treatises and to popular pamphlets, and he muddled the views of political economists and politicians. Nor did he fully develop most of the lines of his attack. If this had been the sum total of his writings on economics he would be no more interesting as an economist than Carlyle and far less interesting than Morris (whom Professor Fain for some reason does not mention).

The three most interesting elements in Ruskin's constructive economics are his emphasis on consumption (" the final object of political economy is to get a good method of consumption "), his analysis of social costs (particularly human costs) and his sharp distrust of the economic division of labour. The tools of industry, he maintained, shape two products—the men who work and the articles they make. On the quality of the articles he had less to say than Morris: on the men he had much to say which is still relevant in modern industrial relations. The " great and civilized invention of the division of labour " has been much studied, he wrote, but it is falsely named: " it is not, truly speaking, the labour that is divided; but the men: Divided into mere segments of men—broken into small fragments and crumbs of life." Interestingly enough this passage comes from *The Stones of Venice* (1853) before his economic doctrines were fully formulated: if he had made the comment the first chapter of a full treatise on political economy, as Adam Smith did his, he might still be read by twentieth-century economists.

Professor Fain's book sticks a little too close to the verbal arguments of

Ruskin, his adversaries, his critics and his disciples to breathe the life which Ruskin himself talked so much about. A fuller treatment of the mid-Victorian ideas of money, commerce and art would have placed Ruskin in a fuller context. The relevance of his ideas to twentieth-century conditions in a very different kind of economy—with, for the most part, a different kind of economist—deserves more attention. Professor Fain mentions Veblen and Professor Tawney. It would have been interesting to explore the differences as well as the similarities between Veblen's and Ruskin's work and to follow the links between *Unto This Last* and *The Acquisitive Society*. Like Veblen, Tawney and Hobson, Ruskin distrusted the curtailment of scope in theoretical economics even though it permitted greater precision. Like them, he refused to divorce problems of the economy and problems of the society. For all his misunderstanding—some of it seems deliberate—he had insights, and Professor Fain has been wise to point them out.

ASA BRIGGS

*University of Leeds.*

# NOTES AND MEMORANDA

## IMPORT DUTIES AND THE GROSS DOMESTIC PRODUCT AT MARKET PRICES

In the December 1957 issue of the Economic Journal Mr. H. Burton of Exeter University claims that the method of valuing imports at market prices which was first used in the 1954 National Income Blue Book: (i) constitutes a departure from internationally accepted conventions; (ii) produces internal inconsistencies; (iii) lacks theoretical justification; and (iv) leaves a gap in the statistics for years other than 1948. His article[1] relies largely on assertions the reasons for which are not always evident; nevertheless, some reply is called for.

The estimates of the gross domestic product at constant market prices, given in recent Blue Books, make use of the equation:

Gross domestic product
= Consumption + Gross domestic investment + Exports − Imports.

The estimates of expenditure on imports at 1948 market prices include import duties, at the rates current in 1948. Corresponding estimates at current market prices have not hitherto been given in the Blue Books. The only additional figures needed to obtain such estimates are the amounts of customs duties on imports. We do not know the total duties on imports paid for in the year—and it is the balance-of-payments figures which are used in the national-income estimates—but the total amounts of customs duties collected each year are available,[2] and anyone who wishes to do so can use these figures *faute de mieux*.

The correct treatment of duties on imports was considered for the first time in the course of preparing estimates of the gross domestic product at constant market prices for the 1954 Blue Book. The problem had not previously been discussed, either in the United Kingdom or internationally. It is true that in the United Nations and O.E.E.C. systems of national accounts the national (or domestic) income (or product) at market prices is taken to be the value at factor cost *plus* total net indirect taxes collected within the country, including import duties. But, at the time when these systems were drawn up, no one had put forward any alternative. It is unfair to suggest that these international organisations disagree with a method which they have not yet discussed.

[1] "Expenditure Taxes, Imports and Gross Domestic Product at Market Prices," Economic Journal, Vol. LXVII, December 1957, p. 644.

[2] In the *Annual Statement of the Trade of the United Kingdom* (Supplement to Volume II) and, on a slightly different basis, in the *Monthly Digest of Statistics* (cf. March 1958 issue, Table 134).

Consistency demands that the same method be applied to the estimates at constant market prices and the estimates at current market prices of both the national and the domestic product. But since the Blue Books do not contain any estimates of the gross national product at current or constant market prices, or of the gross domestic product at current market prices —indeed, this is one of Mr. Burton's complaints—there cannot be said to be any internal inconsistency.[1] Nor is there any conflict between the Blue Book estimates and the proposition that net income from abroad is equal to the difference between the gross national product at market prices (no estimates of which are given) and the gross domestic product at market prices. Since Mr. Burton combines the Blue Book estimates of the gross domestic product at constant market prices with current-price estimates which he himself has compiled in accordance with a different system, it is not surprising that he manages to obtain some odd results.[2]

The reasons for the present treatment of duties on imports have been set out elsewhere,[3] and no more than a brief summary need be given here. In the equation quoted above every term should be valued in the same kind of prices, whether factor costs or market prices. It is just as wrong to combine market-price valuation of one item with factor-cost valuation of another as it is to add metres to yards. The market prices of imports, being the prices actually paid by the purchaser, include import duties. Since all imports enter into consumption, domestic investment or exports, any duties on imports will be included in the market-price valuation of one of these three categories. Thus when we add together

Consumption + Gross domestic investment + Exports − Imports,

valuing each at market prices, import duties will be included in one or other of the positive terms and also in the negative term (imports) and will not, therefore, affect the (algebraic) sum, which is equal to the gross domestic product at market prices.

The latter is also equal to the sum of the net outputs (including depreciation) of all domestic industries, valued in each case at market prices. Any commodity which is not part of the output of a domestic industry is not part of the gross domestic product. Hence any tax on such a commodity should not be included in the value of the gross domestic product. Since imported tobacco is not part of the net output of the cigarette-manufacturing industry,

[1] Estimates of the gross national product of the United Kingdom at current market prices, in accordance with the U.N. and O.E.E.C. systems, were included in some of the earlier White Papers on National Income, but have not been given since 1951.

[2] The statement in *National Income Statistics—Sources and Methods* that those who want estimates at market prices can easily get them by adding taxes on expenditure to, and deducting subsidies from, the aggregates shown at factor cost, although not implying any preference for one definition rather than another, was perhaps misleading in not referring at the same time to the recent change in the treatment of import duties.

[3] J. L. Nicholson "National Income at Factor Cost or Market Prices?" ECONOMIC JOURNAL, Vol. LXV, June 1955, p. 216.

how can a customs tax on tobacco form part of the gross domestic product of the United Kingdom?

Estimates at market prices derive their importance from the underlying assumption that, in equilibrium, the marginal productivity or marginal utility of each commodity is proportional to its market price. Thus, if the duty on an imported commodity is reduced or removed, the amount imported will increase, causing its marginal productivity and marginal utility to fall, until equilibrium in relation to the new (lower) price is re-established. If duties were not included in the prices of imports, the relative quantities purchased would not have this precise relationship to relative prices.

Mr. Burton comes close to endorsing an important part of my argument when he writes (p. 648), " Furthermore, a value which includes taxes levied on imports, and which can vary with changes in the volume of imports or the rates of taxes levied on them, can hardly be a useful or reasonable measure of income accruing to a nation but not due to current activity within the domestic territory." The argument which is here applied to net income from abroad is equally applicable to the domestic product. Can changes in import duties, or in the volume of imports, really be regarded as part of domestic economic activity? " One can agree," he also writes (p. 651), " that the valuation of imports at market prices should include taxes levied on them." He immediately adds " but . . . $Tm$ (import duties) have already been included . . . in $C + I + X$, and . . . to include $Tm$ again with negative sign appears to produce the opposite result to that intended." It is difficult to know what to make of this remark. Either Mr. Burton has not said what he intended to say, or he agrees that our intention is correct in which case most of his criticisms fall to the ground. That our intention is in fact carried out has been shown above.

Later (p. 652) he expresses the view that, if taxes on imports rise and everything else including the volume of imports and the output of every domestic industry remains unchanged, the gross domestic product at market prices should rise by the same amount, whereas in the official treatment—as he says himself—it would be unchanged. Taxes on imports should not have the same effect on the gross domestic product at market prices as taxes on the products of home industry, simply because the latter form part of the gross domestic product while imports do not. Mr. Burton is able to agree that " imports at market prices should include the taxes levied on them," but fights shy of the consequences.

One consequence is that the difference between the gross domestic (or national) product at market prices and the gross domestic (or national) product at factor cost is not equal to the total of net indirect taxes *collected* within the country; but it is equal to the sum of net indirect taxes on all constituents of the gross domestic (or national) product. Unless the very collection of customs duties is regarded as a productive economic activity the value of which is correctly measured by the total amount paid in duties—and no one

has suggested that the work done by tax collectors is quite as important as all that!—the latter identity is more important than the former.[1]

Mr. Burton never comes to grips with the arguments set out in my article. His frequent use of the phrase " this seems reasonable (or unreasonable) " does not add up to an effective answer. Further comment seems unnecessary except on one point. Mr. Burton chides us for using the word " welfare " in explaining the national income estimates. He thinks that, as a result, national-income accounting is in danger of becoming a controversial subject. It is difficult to recall any time when the national income was not a controversial subject; it also seems doubtful whether it can be freed of all welfare and productivity connotation and still remain a useful tool in economic analysis.

J. L. NICHOLSON

*Central Statistical Office.*

## CURRENT TOPICS

THE Annual Meeting of the Royal Economic Society will be held at the London School of Economics at 5 p.m. on Thursday, July 17. After formal business, Sir Alexander Carr-Saunders will address the Society on " The Place of Economics and Allied Subjects in the Curriculum."

MR. S. R. DENNISON, Fellow of Gonville and Caius College, Cambridge, and University Lecturer in Economics has been elected to the Chair of Economics in the Queen's University, Belfast. Mr. A. J. Youngson, Fellow of Emmanuel College, Cambridge, and University Lecturer in Economic History has been elected to the Chair of Economic History in Edinburgh University.

NUFFIELD COLLEGE, Oxford, has recently elected to Honorary Fellowships of the College Mr. R. F. Harrod, Nuffield Reader in International Economics, Professor J. R. Hicks, Drummond Professor of Political Economy, and Mr. K. C. Wheare, Rector of Exeter College and formerly Gladstone Professor of Government and Public Administration.

[1] The only way of partially salvaging the previous method is to treat import duties as part of the gross domestic products at market prices of foreign countries which is appropriated from them by the home country. Any countries which impose customs duties on imports from this country would likewise be regarded as appropriating part of our gross domestic product. Customs duties on imports would then form part of the domestic and national income. But they could not be regarded as part of the domestic product which would, however, include any customs duties levied by foreign countries on imports from this country.

PROFESSOR E. DEVONS of the University of Manchester has been elected to the university Chair of Commerce (with special reference to international trade) at the London School of Economics and Political Science. Mr. A. W. Phillips, Reader in Economics, has been elected to the Tooke Chair of Economics and Statistics, also at the London School of Economics.

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PROFESSOR W. A. LEWIS, Stanley Jevons Professor of Political Economy in the University of Manchester, has accepted appointment to the Chair of Economics in the University of the West Indies.

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MR. R. R. NEILD, Fellow of Trinity College, is leaving Cambridge to join the staff of the National Institute of Economic and Social Research and to take part in the new work of the Institute in the analysis of current economic trends.

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THE following have been admitted to Life Fellowship of the Society:

| | | |
|---|---|---|
| Ara, Prof. K. | Chauhan, M. | Pandit, R. |
| Bell, Prof. P. W. | Geirsch, Prof. Dr. H | Shoup, Prof. C. S. |
| Breton, A. | Guerra, Dr. J. A. | Thornton, P. H. N. |
| Carpenter, G. | Lowell Harriss, Prof. C. | Wang, Dr. N. T. |

THE following have been admitted to Fellowship of the Society:

| | | |
|---|---|---|
| Abu-Hamdan, H. | Caldwell-Jones, J. | Feiyisetan, G. O. |
| Adeusi, A. | Calvert, H. | Folk, H. |
| Adjei, A. E. T. | Chadha, N. S. | Fox, G. E. P. |
| Adler-Karlsson, G. | Chan, Fook Chuan | Ghandi, G. K. |
| Ala-Ud-Din, S. | Chapman, A. | Ghose, A. B. |
| Alderson, J. A. | Chaudhuri, N. N. | Girolami, P. |
| Amzart, M. A. | Choi, Prof. H. | Goenka, M. L. K. |
| Anandappa, A. P. | Chougale, K. B. | Goldblatt, L. D. |
| Anyane, S. L. | Chow Tin-Sik | Gottheil, F. |
| Ayoade, G. O. A. | Church, Miss R. M. | Green, D. |
| Bailey, D. T. | Cutolo, Prof. I. | Griffiths, A. E. T. |
| Bamford, A. | Davies, J. B. | Guy, G. |
| Bartlett, D. E. | De Cindio, Dr. F. | Han Kang Hong |
| Bell, W. H. | De Decker, H. | Haran, M. P. |
| Bhandarkar, M. S. | Dent, I. J. K. | Harewood, R. J. |
| Blanks, P. J. | Ejione, U. A. | Harvey, D. R. |
| Browne, C. C. | Essig, S. B. | Hughes, F. H. |
| Burgess, R. F. | Fan, M. H. | Hyett, G. P. |

Iwegbu, G. N.
James, D. G.
Kahan, A.
Keller, R. H.
Krotki, K. J.
Kumar, K. R.
Littler, K. T.
Livingstone, J. M.
Lu Yaw
MacDowell, G. F.
MacPherson, W. J.
Maduekwe, M. A.
Marrash, W. B.
Moul, R. P.
Munshi, D. M.
Murray, M. J.
Naish, D. E. G.
Neisser, H.
Norie, R. H.
Ogunleye, M. A. C.
Olaniyan, C. F. I.
Oliver, J. M.
Palshikar, M. B.
Pickering, M. A.
Pitman, S. L. E.
Prior, E. A.
Ralph, J. H.
Reynolds, L. G.
Rhee, K. J.
Robinson, G. B.
Romanis, Miss A. W.
Rosen, D.
Rosenberg, Prof. N.
Rossell, C.
Saito, T.
Sapsford, A.
Sethi, K. C. K.
Sharp, D. P.
Shepherd, W. A.
Simpson, A. H.
Siong Seouw Lin
Skinner, F. E.
Small, J. R.
Smith, W. P.
Snowdon, J. M.
Sparrow, J.
Spraos, J.
Spreenivasa-Iyer, Y. S.
Stout, D. K.
Swendell, E. B.
Taplin, E. L.
Tawari, B. R.
Thompson, J.
Turner, P. H.
Valentine, E.
Virani, H. H.
Walker, C. S.
Whinston, A.
Wijesinghe, O.
Yeager, L. B.

THE following have been admitted to Library Membership of the Society:

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Banco Espanol en Londres, London.
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Japan Productivity Center, Tokyo.
Junta de Comercio Externo, Luanda, Angola.
Knox College, Galesburg, Illinois.
Mercer University, Macon, Georgia.
Midland College, Fremont, Nebraska.
Odessa College, Odessa, Texas.
Organisation for European Economic Co-operation, Paris.
Orient Buchhandlung, Cologne, Germany.
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Rand Corporation Library, Santa Monica, California.
University of Alaska Library, College, Alaska.
Volkswirtschaftliches Institut, Freien Universitat, Berlin-Dahlem.

# RECENT PERIODICALS AND NEW BOOKS

*Applied Statistics*

VOL. VII, NO. 1, MARCH 1958. *Studies in the Variability of Two Blood-clotting Tests:* P. ARMITAGE and G. I. C. INGRAM. *Official Statistics of Economic Trends:* R. J. MAURICE. *Probits: an Application to Observational Data:* J. K. FRIEND. *Statistics of an Auction Sale:* D. C. DUNCAN. *A Regression Control Chart for Costs:* E. MANSFIELD and H. H. WEIN. *Initial Letters of Surnames:* P. G. GRAY.

*Economica*

VOL. XXV, NO. 97, FEBRUARY 1958. *The Problem of "Success Indicators" in Soviet Industry:* A. NOVE. *Movements in Retail Prices Since 1953:* R. G. D. ALLEN. *Behaviourist Cardinalism in Utility Theory:* T. MAJUMDAR. *The Theory of the Economic Effects of Government Expenditure in English Classical Political Economy:* B. A. CORRY. *A Note on the Early History of Consumer's Surplus:* R. W. HOUGHTON. *Input–Output Approach in an Allocation System:* A. GHOSH.

*The Review of Economic Studies*

VOL. XXV, NO. 67, FEBRUARY 1958. *Liquidity Preference as Behaviour Towards Risk:* J. TOBIN. *Owner Elasticities of Durable Consumer Goods:* J. S. CRAMER. *Transformations in Economic Theories:* M. MCMANUS. *A Note on the Theory of Interindustrial Wage Differentials:* L. JOHANSEN. *Substitution, Complementarity, and its Residual Variation around Engel Curves:* H. H. THEIL and H. NEUDECKER. *Consistency of Preference: The Two-Commodity Case:* H. ROSE. *Trader's Behaviour—an Alternative Explanation:* T. I. MATUSCZEWSKI. *Entrepreneurial Behaviour and Market Environment:* J. H. DAVIES.

*Oxford Economic Papers*

VOL. 10, NO. 1, FEBRUARY 1958. *The Excess Demand for Labour: A Study of Conditions in Great Britain, 1946–56:* J. C. R. DOW and L. A. DICKS-MIREAUX. *The Eisenhower Administration and the Recession, 1953–5:* A. E. HOLMANS. *Intertemporal Relation of Demand and the Preference System of the Firm:* S. AHMAD. *The Development of the Tied House System in London:* D. M. KNOX. *Insurance Companies and the Finance of Industry:* G. CLAYTON and W. T. OSBORN. *The Methodology of the Theory of Return to Scale:* D. SCHWARTZMAN. *Valuation, Demand, and the "Anti-Giffen" Case:* M. C. KEMP. *In Defence of Public-Utility Price Theory:* M. J. FARRELL.

*Bulletin of the Oxford University Institute of Statistics*

VOL. 20, NO. 1, FEBRUARY 1958. *The Tempo of Soviet Industrial Expansion:* F. SETON. *U.K. Balance of Payments, 1946–55:* J. MITCHELL. *Changes in Stocks of Mainly Imported Goods in the United Kingdom:* M. FG. SCOTT. *Aspects of the Dynamics of Consumer Behaviour:* P. VANDOME. *A "Human Needs" Diet—Autumn 1957:* T. SCHULZ.

*The Manchester School of Economic and Social Studies*

VOL. XXVI, NO. 1, JANUARY 1958. *Unlimited Labour: Further Notes:* W. A. LEWIS. *Estimates of Elasticities of Demand for Exports of the U.K. and the U.S., 1921–1938:* R. E. ZELDER. *An Indian View of the Expenditure Tax:* OM PRAKASH. *A Note on Professor Rostow's "Take-off" into Self-sustained Growth:* D. C. NORTH.

*London and Cambridge Economic Bulletin*

NEW SERIES NO. 25, MARCH 1958. *The Economic Position. The International Outlook:* R. R. NEILD. *Exchequer Grants to Local Authorities:* D. S. LEES. *Home Finance:* R. F. G. ALFORD and H. C. EDEY. *Prices and Wages:* R. G. D. ALLEN and H. S. BOOKER. *Quarterly Income and Expenditure Statistics:* W. B. REDDAWAY. *International Finance:* A. C. L. DAY.

*Scottish Journal of Political Economy*

VOL. V, NO. 1, FEBRUARY 1958. *Pluralism, Politics and Sociology:* J. A. MACK. *Economic Schizophrenia:* A. K. CAIRNCROSS. *The Establishment of the Scottish Steel Industry:* I. F. GIBSON. *Statistical Production Functions and Economic Development:* C. E. V. LESER. *The Practical Uses of Input–Output Analysis:* I. G. STEWART.

*The Economic History Review*

VOL. X, NO. 3, APRIL 1958. *Trek:* W. K. HANCOCK. *Some Thirteenth-century Censuses:* H. E. HALLAM. *The Market for Monastic Property, 1539–1603:* H. J. HABAKKUK. *The Breakdown of Gild and Corporation Control over the Handicraft and Retail Trade in London:* J. R. KELLETT. *Trends in Eighteenth-century Smuggling:* W. A. COLE. *Newspaper Printing in the Industrial Revolution:* A. E. MUSSON.

*The Journal of Industrial Economics*

VOL. VI, NO. 2, FEBRUARY 1958. *Oil Supplies During the Suez Crisis:* P. H. FRANKEL. *The Pattern of Growth in Belgian Manufacturing Industry: 1937–56:* A. LAMFALUSSY. *The Market for Castings in Baltimore: Market Scope in a Customer-centered Industry:* L. SAVILL. *F.C.I. and the Capital Market:* I. HICKS and R. W. HOUGHTON. *Some Thoughts on Automation in a British Office:* P. HADDY.

*Political Studies*

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*International Affairs*

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*The British Journal of Sociology*

VOL. IX, NO. 1, MARCH 1958. *Social Mobility and the American Business Elite—II:* R. BENDIX and F. W. HOWTON. *Genetics, Social Structure and Intelligence:* A. H. HALSEY. *The Structure of Power in American Society:* C. WRIGHT MILLS. *Stratification, Education, and Occupational Orientation: A Parallel Study and Review:* R. M. STEPHENSON. *Trends in the Development of Criminology in Britain:* G. ROSE. *Freedom and Coercion:* R. MILIBAND. *The Far West of Islam:* E. GELLNER.

*Journal of Agricultural Economics*

VOL. XII, NO. 4, DECEMBER 1957. *Farming since the First World War:* W. S. ABBOTT. *Work Study and the Agricultural Economist:* V. BAKER. *Highland Estates Challenge to the Economist:* A. G. CHALMERS. *The Siting of Urban Development on Agricultural Land:* J. T. WARD. *Linear Programming and the Combination of Enterprises in Tropical Agriculture:* A. M. M. MCFARQUHAR and A. EVANS.

*The Agricultural History Review*

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*The Farm Economist*

VOL. VIII, NOS. 11–12, 1957. *A Further Study of the Productivity of Large and Small Farms in Cambridgeshire:* F. G. FORSYTH. *The Utilization of Milk in the Home:* J. EMPSON. *Regional Variations in Road Transport Costs: Milk Collection from Farms in England and Wales:* M. CHISHOLM.

### *British Tax Review*

MARCH 1958. *The Budget, 1958—A Poor Prospect:* A. R. ILERSIC. *Valuation of Minority Shareholdings in Private Companies for Estate Duty Purposes:* W. B. S. WALKER. *The Taxation of Capital Gains in the United States and the United Kingdom: I:* W. W. BRUDNO and L. D. HOLLMANN. *"On" Death:* W. PHILLIPS. *The Possibilities and Uses of Incorporation for Professional Firms:* P. M. CHRISTOPHERSON and J. W. MAYO. *The Implications of a Free Trade Area for British Taxation:* W. B. REDDAWAY. *Modern Methods of Minimising Taxation: VIII: Disclaimer and its Revenue Possibilities:* J. B. MORCOM.

### *Accounting Research*

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### *Journal of the Institute of Actuaries*

VOL. 83, PART II, NO. 364, 1957. *The Application of Actuarial Principles to the Transaction of Overseas Life Business:* R. S. SKERMAN. *The Actuarial Management of a Life Office:* J. L. ANDERSON and J. D. BINNS. *Population Mortality and Assured Lives Mortality in Great Britain—a Comparison of Trends:* H. A. R. BARNETT.

VOL. 83, PART III, NO. 365, 1957. *Preservation of Pension Rights:* F. H. SPRATLING, F. W. BACON and A. E. BROMFIELD. *The Measurement of Morbidity:* B. BENJAMIN. *Lidstone's Z-Method without Makeham's Law:* N. A. MUNRO. *An Analysis of the Claim Records of a Motor Insurance Company:* N. L. JOHNSON and F. GARWOOD. *The Recent Trend of Mortality in Great Britain:* W. S. HOCKING.

### *The Banker*

VOL. 108, NO. 385, FEBRUARY 1958. *Mr. Thorneycroft Makes His Point. London's Overseas Credits. Belgium's Different Treasury Crisis:* G. GORDON. *Credit Expansion at Seven Per Cent. Australia's Banking Controversy:* H. W. ARNDT.

VOL. 108, NO. 386, MARCH 1958. *Challenge to the Bank. Europe's Dangerous Discord. New Phase in Wage Bargaining:* M. SHANKS. *Bank, City and Public: The Bank of England from Within; New Light on the City. Irish Banks in a Stronger Economy. Life Assurance Looks Ahead:* T. H. PEACE.

VOL. 108, NO. 387, APRIL 1958. *Budget After Bank Rate. Treasury Control in the Age of Inflation:* J. ENOCH POWELL. *Exchange Policy in the Forward Market: Case for an Official Peg:* J. SPRAOS; *Case for Official Support:* A. E. JASAY; *Case for the Status Quo. New Zealand between Two Fires:* J. W. ROWE. *Israel's Economic Problem:* Y. RAMATI. *American Banking before the Turn:* F. E. DANIELS. *How Serious is Welsh Unemployment?:* E. V. MORGAN. *Contracts Violating Foreign Law:* S. G. MAURICE.

VOL. 108, NO. 388, MAY 1958. *Expansion Deferred. Britain's Economy Portrayed. Financing the Public Industries:* J. E. HARTSHORN. *Question Marks Over Canada's Economy:* E. P. NEUFELD. *Foreign Capital in Canada:* M. F. LLOYD PRICHARD. *Building Societies and the Law:* J. MARVIN. *Britain's Invisible Earnings:* J. MITCHELL. *Scotland: A Financial and Industrial Survey: Diversification Faces its Test:* D. J. ROBERTSON; *More Economical Banking?:* M. GASKIN; *Strip Mill—Pros and Cons:* R. H. CAMPBELL; *The Bank Balance Sheets Analysed.*

### *The Bankers' Magazine*

VOL. CLXXXV, NO. 1367, FEBRUARY 1958. *Banking Results for 1957. The Bank Rate Tribunal's Report. Survey of Economic Conditions in the U.S.A.: The Economic State of the Union.*

VOL. CLXXXV, NO. 1368, MARCH 1958. *Some Notes on Inflation in Post-war Britain:* R. J. BALL. *Survey of Economic Conditions in the U.S.A.: The Need for Vigorous Counter-Cyclical Measures. Hire Purchase in a Free Society:* J. A. BATES. *Banking and Economic Conditions in the Irish Republic in 1957:* G. A. DUNCAN. *Hire Purchase and the Banks in Australia:* A. T. MAXWELL.

VOL. CLXXXV, NO. 1369, APRIL 1958. *Bank Rate: Progress and Prospects:* SIR R. HAWTREY. *Survey of Economic Conditions in the U.S.A.: Either a Sustained Spring Recovery or Tax Cuts. Lifebelts for Sterling?:* A. C. L. DAY. *Linking Wages to Productivity?:* J. SPRAOS.

*Barclays Bank Review*

VOL. XXXIII, NO. 1, FEBRUARY 1958. *The Chairmen. Foreign Trade in 1957. Economic Aspects of the Atlantic Alliance.*

*District Bank Review*

NO. 125, MARCH 1958. *Progress, Prices and the Pound:* F. W. PAISH. *Economic Jargon:* A. N. SHIMMIN. *Is the Sterling Area Worth While?*

*Lloyds Bank Review*

NO. 48, APRIL 1958. *Thoughts on the Crisis:* L. C. ROBBINS. *Ten Years of European Co-operation:* E. ROLL.

*Midland Bank Review*

FEBRUARY 1958. *Government Debt Policy and the Banking System. The Post Office. New Capital Issues in 1957.*
MAY 1958. *The Midland Bank Index of Business Turnover. Monetary Survey 1957–8. Basic Services: Power and Transport.*

*National Provincial Bank Review*

NO. 41, FEBRUARY 1958. *The World Bank and the Sterling Area:* W. A. B. ILIFF. *The Plastics Industry, 1958:* P. MORGAN. *The Changing Note:* R. J. MARTIN.

*The Three Banks Review*

NO. 37, MARCH 1958. *Tests of the Validity of Some Stock Exchange Folk-lore:* P. SARGANT FLORENCE. *Insurance Companies and the Capital Market:* G. CLAYTON and W. T. OSBORN. *In Reply to Your Advertisement.*

*Westminster Bank Review*

FEBRUARY 1958. *The Chairman's Statement. The Pattern of Fixed Capital Investment in Britain:* A. K. CAIRNCROSS. *British Monetary Policy and the Overseas Sterling Area:* R. G. OPIE. *The Overfeeding of Dairy Cows:* A. G. ANTILL and C. CLARK.

*Planning*

VOL. XXIV, NO. 418, JANUARY 1958. *Policy for Water.*
VOL. XXIV, NO. 419, FEBRUARY 1958. *Refugees in Britain: Hungarians and Anglo-Egyptians.*
VOL. XXIV, NO. 420, MARCH 1958. *Television in Britain.*
VOL. XXIV, NO. 421, APRIL 1958. *The Debate on Sterling.*

*Town and Country Planning*

VOL. XXVI, NO. 2, FEBRUARY 1958. *Building, Planning and Squeezing. Government Policies and Building Costs:* A. F. EWING. *Town Planning in Czechoslovakia: I:* J. STVÁN. *The Economics of High Building:* C. CLARK. *Planning in Spain:* G. D. HARPMAN.
VOL. XXVI, NO. 3, MARCH 1958. *Planning for Family Life and Leisure: I:* Y. LARSSON. *Social Satisfaction in Planning:* G. B. TAYLOR. *Town Planning in Czechoslovakia: II:* J. STVÁN.
VOL. XXVI, NO. 4, APRIL 1958. *Planning for Family Life and Leisure: II:* Y. LARSSON. *Study in Neighbourhood Planning:* G. B. TAYLOR. *Planning and Public Transport:* J. ARMSTRONG.

*Which?*

VOL. 1, NO. 3, SPRING 1958. *Reports on Sheets, Hire Purchase, Automatic Toasters, Steam Irons, Orange Drinks, Compound Aspirins, Protein Foods, Night-Driving Glasses.*

*Journal of the Institute of Transport*

VOL. 27, NO. 8, JANUARY 1958. *The Application of Automation to Transport:* SIR W. PUCKEY. *Lighters and Lighterage:* P. S. HENMAN.

VOL. 27, NO. 9, MARCH 1958. *Transport and the Commonweal:* G. N. RUSSELL. *Railway Freight Traffic Operation:* C. P. HOPKINS. *Regularity: Passenger Transport's Primary Need:* J. B. BURNELL. *Liner Operation and the Turn-round of Shipping:* R. S. MACTIER. *The Problem of Passenger Transport in Small Towns and Rural Districts:* C. S. DUNBAR.

*Cartel*

VOL. 8, NO. 1, JANUARY 1958. *Cartel Petition in Switzerland:* B. WITTWER. *Japan Puts Back the Clock:* M. TAMPLIN. *The New German Cartel Law:* K. TRESCHER. *Concentration in American Industry:* R. EVELY. *Changes in Consumption. Cost of a Second Mortgage. Urbanisation and Distribution.*

*Hard Fibres*

NO. 28, MARCH 1958. *Forecasts for 1958. Japan's Expanding Fibre Market.*

*Progress (Lever Bros.)*

VOL. 46, NO. 257, WINTER 1957/8. *The British Railways Modernization Plans:* SIR B. ROBERTSON. *Western Ways to the University:* W. JAMES. *In the Eye of the Beholder:* E. MACDONALD. *Industry for the Needy Countries:* E. R. BAKER. *The Revised "African Survey":* F. A. MONTAGUE. *The Scientist in American Industry:* R. SINCLAIR. *Overseas Labour: A Factory Experiment:* D. BURN.

*Journal of the Statistical and Social Inquiry Society of Ireland*

VOL. XIX, 1955–56. *Radio Éireann Listener Research Inquiries 1953–55:* K. G. FORECAST. *National Insurance Adjudication:* L. A. SHERIDAN. *The Port of Cork:* J. J. HORGAN. *Hill Land Utilisation in Ulster: Some Current Problems:* L. SYMONS. *Marriage in Ireland after the Famine: The Diffusion of the Match:* K. H. CONNELL. *Symposium on the Report of the Commission on Emigration and other Population Problems. The Significance of Veterinary Science in the National Economy:* P. HARNETT. *Irish Hospital Finances:* O. P. HAGARDON. *Some Problems of Integration in the Hospital Service in Northern Ireland:* D. G. NEILL. *Capital Formation, Saving and Economic Progress:* T. K. WHITAKER.

*The Irish Banking Review*

NOVEMBER 1957. *The International Monetary Fund and the International Bank for Reconstruction and Development. Ireland in the Age of Inflation. The Psychological Elements in Federal Reserve Policies:* C. R. WHITTLESEY.

*The Economic Record*

VOL. XXXIII, NO. 66, DECEMBER 1957. *The Australian Economy, September 1957:* H. W. ARNDT. *The New Zealand Economy, 1956–7:* C. G. F. SIMKIN. *Balance in the World Food Position:* SIR S. WADHAM. *Some Recent Advances in Statistics:* E. J. HANNAN. *The 1946–7 Transactions Table:* B. CAMERON. *Company Mergers in Australia:* J. BUSHNELL. *A Model of the Trade Cycle:* H. R. HUDSON.

*The South African Journal of Economics*

VOL. 25, NO. 4, DECEMBER 1957. *Inflation in Europe:* F. A. LUTZ. *The Growth of Government in South Africa since Union:* C. S. RICHARDS. *The Competition of South African Harbours and Lourenço Marques for the Ocean-borne Imports of the Transvaal "Competitive Area":* C. VERBURGH. *A Note on Native Labour Turnover and the Structure of the Labour Force in the Cape Peninsula:* S. VAN DER HORST. *A Short Life of Sir James Steuart: Political Economist:* W. L. TAYLOR.

*The Canadian Journal of Economics and Political Science*

VOL. 24, NO. 1, FEBRUARY 1958. *Puzzles of the "Wealth of Nations":* A. H. COLE. *Demographic Trends in Canada, 1941–56:* A. H. LE NEVEU and Y. KASAHARA. *Changing Structural Factors in Canada's Cyclical Sensitivity, 1903–54:* G. ROSENBLUTH. *Confederation*

*and Responsible Government:* N. WARD. *Regional Decentralization of Government Departments in Britain:* J. S. HARRIS. *The Movement towards Labour Unity in Canada:* E. FORSEY. *The Impact of the Post-war Industrial Expansion on Ontario's Agriculture:* W. M. DRUMMOND.

*The Indian Economic Journal*

VOL. V, NO. 2, OCTOBER 1957. *Nationalization of Life Insurance:* T. P. SUBRAMONIAN. *Housing in India:* V. T. MATHEWS. *Public Sector and Private Sector:* S. K. MURANJAN. *The Supply Curve of a Buyer-seller:* H. EZEKIEL. *On Basic Postulates for Food-grains Price Policy:* P. Y. CHINCHANKAR.

VOL. V, NO. 3, JANUARY 1958. *People's Capitalism for Export?* H. C. WALLICH. *Long Term Changes in Output and Income in India, 1896–1960:* S. J. PATEL. *The Dearth of Dollars:* S. S. TANGRI. *State Finance Corporations in India:* C. K. SHAH. *All This—and Sociology Too:* F. A. MEHTA.

*The Indian Economic Review*

VOL. III, NO. 4, AUGUST 1957. *Determinants of Money Supply: India, 1914–1950:* D. V. RAMANA. *Real Wages and Profits in India, 1939–1950:* S. A. PALEKAR. *Ratio of Interchange between Agricultural and Manufactured Goods in Relation to Capital Formation in Underdeveloped Economies:* D. NARAIN. *Unemployment, Relative Prices and the Saving Potential:* A. K. SEN. *A Note on Pricing in Irrigation Projects:* G. V. N. REDDY.

*Sankhyā*

VOL. 18, PARTS 3 AND 4, SEPTEMBER 1957. *The Underworld of Probability:* SIR R. A. FISHER. *On Unbiased Estimates of Uniformly Minimum Variance:* R. R. BAHADUR. *National Sample Survey, Number Nine: Survey of Displaced Persons in the Urban Areas of the Bombay State. The Multiplex Method for Linear Programming:* R. FRISCH. *Soldiers with Unusually Low Blood Pressure:* N. T. MATHEW. *Unbiased Minimum Variance Estimation in a Class of Discrete Distribution:* J. ROY and S. K. MITRA. *Ordered and Unordered Estimators in Sampling without Replacement:* M. N. MURTHY. *A Lower Bound to the Probability of Student's Ratio:* S. K. BANERJEE.

*The National Overseas and Grindlays Review (formerly The National Bank of India Review)*

VOL. 4, NO. 1, JANUARY 1958. *Historic Bank Merger Completed. The City and the Sterling Area. Burma's First Decade of Independence.*

VOL. 4, NO. 2, APRIL 1958. *The Growth of New Civil Services: Changing Administrations in Asia and Africa. Background to the American Recession:* B. MORTIMER. *Prospect in Rhodesia and Nyasaland.*

*Tata Quarterly*

VOL. XIII, NO. 1, JANUARY 1958. *Distinctive Features of Agricultural Planning.*

*Arthaniti*

VOL. I, NO. 1, NOVEMBER 1957. (This is the first issue of the new bi-annual journal of the Department of Economics of Calcutta University.) *The Meaning and Scope of Economic Welfare:* T. MAJUMDAR. *An Essay on the Keynesian System:* P. CHAKRABARTTY. *On a Model of Planned Growth:* A. K. BISWAS. *The Mahalanobis Model of Development Planning:* S. CHAKRAVARTY. *A Macro-economic Approach to Profits:* S. K. BHATTACHARYYA. *Economic Interpretation of Government Budgets:* D. BHATTACHARYYA. *The Crisis in India's Foreign Exchange Reserves:* S. K. BASU.

*Population Review*

VOL. 2, NO. 1, JANUARY 1958. *The Ecological Structure of an Asian City: An East–West Comparison:* N. P. GIST. *The Phenomenon of Longevity:* C. ALEXANDER. *Spatial Aspects of the Housing Problem in Aligarh:* H. F. HIRT. *Psychiatric Institutional Services in India:* A. J. ROBINS. *The Composition of India's Population according to the 1951 Census:* S. CHANDRASEKHAR.

*The Economic Papers*

VOL. II, NO. 2, NOVEMBER 1957. *Socio-economic Survey of Jamshedpur:* B. R. MISRA. *Stock Exchanges:* N. L. NADDA. *Problem of Transport in Coal Industry:* S. L. BISHNOI. *Urban Unemployment in Bihar:* A. KUMAR.

*The Federal Economic Review*

VOL. IV, NO. 2, JULY 1957. *Taxation and Economic Development:* Q. H. SIDDIQI. *Underdevelopment Equilibrium—The Main Problem of Underdeveloped Areas:* S. N. H. NAQVI. *Inflation:* M. RAHMAN. *Price Determination under Oligopoly. The Macro-economic Theory of Distribution—A Recapitulation. Agricultural Policy of Pakistan:* M. HUSSAIN. *A Sociological Approach to Economic and Political Problems:* F. SCHOLFIELD. *A Note on Malthusian Polemics over Capital Accumulation:* M. K. CHOWDHURY. *The Dollar Shortage:* A. H. KADRI. *Agricultural Marketing in East Pakistan:* M. AHMED. *Austerity and Economic Salvation:* Q. M. FAREED.

*Contemporary China*

VOL. 1, 1955. *Chinese–Russian Relations since the Seventeenth Century:* J. J. NOLDE. *The Chinese Eastern Railway:* D. J. ROADES. *Population Problems of China:* T. R. TREGEAR, N. J. LING and R. STRAHAN. *A Note on Chinese Agriculture:* O. L. DAWSON. *The Economic Policy of Maoism:* E. F. SZCZEPANIK. *Four Years of Fiscal Policy in Communist China:* E. F. SZCZEPANIK. *Perspectives of the Industralization Policy in Communist China:* Y. MURAMATSU. *The Planning Structure and the Five Year Plan in China:* G. L. V. HOOTON. *Chinese Communist Campaign for Increased Trade with Japan:* N. P. SMITH.

*International Financial Statistics*

VOL. XI, NO. 1, JANUARY 1958. New pages and notes for Yugoslavia.
VOL. XI, NO. 2, FEBRUARY 1958. Usual statistical material.
VOL. XI, NO. 3, MARCH 1958. Usual statistical material.
VOL. XI, NO. 4, APRIL 1958. New pages and notes for Paraguay.

*International Labour Review*

VOL. LXXVII, NO. 2, FEBRUARY 1958. *Indigenous Labour in Papua–New Guinea:* F. J. WEST. *The Controversy over Trade Union Membership in the United States: I, The Case for Right-to-work Laws:* A. ERWIN; *II, The Case against Right-to-work Laws:* N. GOLDFINGER. *Remploy: An Experiment in Sheltered Employment for the Severely Disabled in Great Britain:* J. L. EDWARDS.

VOL. LXXVII, NO. 3, MARCH 1958. *Vocational Rehabilitation in the United States:* M. E. SWITZER. *Vocational Training in the Federal Republic of Germany:* E. KRAUSE. *Workers' Education in Belgium:* J. NIHON. *Employment of Post-war Immigrants in Australia:* W. D. BORRIE and J. ZUBRZYCKI.

VOL. LXXVII, NO. 4, APRIL 1958. *Effects of the European Common Market on Employment and Social Conditions in Agriculture:* H. NIEHAUS. *The General Confederation of Labour-Force Ouvrière and Workers' Education in France:* G. VIDALENC. *The Co-operative Movement in the British Caribbean:* P. M. SHERLOCK. *Hiring Practices and Employment Experience of Longshoremen in the Port of New York:* V. H. JENSEN.

*United Nations Economic Bulletin for Latin America*

VOL. II, NO. 2, 1957. *Latin America's Foreign Trade in the Early Months of 1957. The Economic Development of Bolivia. Index Clause in Deferred Payments.*

*Econometrica*

VOL. 26, NO. 1, JANUARY 1958. *Utilities, Attitudes, Choices:* K. J. ARROW. *Estimation of Relationships for Limited Dependent Variables:* J. TOBIN. *A Sector Model—The Poultry Industry of the U.S.A.:* M. R. FISHER. *A Linear Programming Model of the U.S. Petroleum Refining Industry:* A. S. MANNE. *The Impact of Changes in the Terms of Trade on Western Europe's Balance of Payments:* G. STUVEL. *A Monte Carlo Study of Estimates of Simultaneous Linear Structural Equations:* H. WAGNER. *Decision and Team Problems in Airline Reservations:*

M. Beckmann. *Sur une corrélation possible entre production, importations et emploi dans les pays industriels:* P. Carré. *Threshold in Choice and the Theory of Demand:* N. Georgescu-Roegen. *Gross Substitutes and the Dynamic Stability of General Equilibrium:* F. Hahn.

*Public Finance*

Vol. XII, No. 4, 1957. *Die Preiskontrolle bei Rüstungsgütern:* G. Schmölders. *Political Aspects of Export Taxation:* F. H. Jackson. *The Finance Commission:* B. R. Misra. *Institut International de Finances Publiques:* M. Masoin. *La Réform Budgétaire de l'Assistance Technique:* R. Roux. *The Literature of Sales Taxation:* J. F. Due.

*Kyklos*

Vol. XI, No. 1, 1958. *Wage Determination Revisited:* J. Pen. *Oikonomia: An Inquiry into Beginnings of Economic Thought and Language:* K. Singer. *A Dynamic Interpretation of Malthus' Principle of Population:* J. E. Moes. *Theoretical Welfare Economics: A Comment:* M. W. Reder. *American Sociology for Europe?:* F. Zweig. *An Analysis of Modern Inflation:* P. Baffi.

*The American Economic Review*

Vol. XLVIII, No. 1, March 1958. *Institutionalism and Welfare Economics:* M. A. Copeland. *Changes in Retailers' Buying:* R. P. Mack and V. Zarnowitz. *The Supply of Storage:* M. J. Brennan. *Foreign Trade, Balanced-budget Multipliers:* F. D. Holzman and A. Zellner. *The Clayton Act: Sleeping Giant of Antitrust?:* R. W. Harbeson.

*The Annals of the American Academy of Political and Social Science*

Vol. 315, January 1958. *Understanding Alcoholism.*
Vol. 316, March 1958. *A Crowding Hemisphere: Population Change in the Americas.*

*The Quarterly Journal of Economics*

Vol. LXXII, No. 1, February 1958. *The Struggle for Commercial Bank Savings:* D. A. Alhadeff and C. P. Alhadeff. *Forecasting Uses of Anticipatory Data on Investment and Sales:* F. Modigliani and H. M. Weingartner. *Economic Planning Reconsidered:* J. E. Elliott. *On the Theory of Negotiation:* C. M. Stevens. *Monetary Surveys and Monetary Analysis:* C. Segré. *The Function of Wage Policy: The Australian Experience:* J. E. Isaac. *Motor Carrier Costs and Minimum Rate Regulation:* H. W. Nicholson.

*The Journal of Political Economy*

Vol. LXV, No. 1, December 1957. *Providing for Growth of the Money Supply:* G. S. Tolley. *Price-setting Problems in the Polish Economy:* J. M. Montias. *Some Evidence on the International Price Mechanism:* A. C. Harberger. *Economic Problems of Alliance:* M. W. Hoag. *Academic Methods for Marxian Problems:* M. Bronfenbrenner. *A Note on Ruble–Dollar Comparisons:* N. M. Kaplan and E. S. Wainstein.
Vol. LXVI, No. 2, April 1958. *The Economics of Slavery in the Ante-Bellum South:* A. H. Conrad and J. R. Meyer. *Capital Formation in Residential Real Estate:* M. G. Reid. *The Economic Articles in the* Quarterly Review *and Their Authors, 1809–52: II:* F. W. Fetter.

*The Review of Economics and Statistics*

Vol. XL, No. 1, Part 1, February 1958. *Income, Assets, and the Demand for Money:* H. F. Lydall. *Monetary Theories of the Rate of Interest: A Dynamic Analysis:* W. L. Smith. *Employment and Output in Banking, 1919–1955:* R. E. Speagle and E. Kohn. *The Contraction of 1953–54:* B. G. Hickman; *Comment:* A. H. Hansen. *Bankers and Subsidies:* A. H. Hansen. *Empirical Research and the Rate of Interest:* A. Spiro. *Accounting for Cost Control in the Soviet Economy:* R. W. Campbell. *The Rate of Interest on Government Foreign Lendings:* S. H. Axilrod. *Debt Repayment and Cyclical Fluctuation:* H. T. Oshima.
Vol. XL, No. 1, Part 2, February 1958. *Problems in International Economics:* Papers and Abstracts of Papers Presented at a Conference on International Economics Called by the Universities–National Bureau Committee for Economic Research. *Introduction:* G. Haberler. *Transactions between World Areas in 1951:* H. B. Woolley. *World Trans-*

*portation Account, 1950–53:* H. F. KARREMAN. *The Commodity Composition of Trade: Selected Industrial Countries, 1900–1954:* R. E. BALDWIN. *The Terms of Trade and Economic Development:* C. P. KINDLEBERGER. *Primary Effects on Employment of Shifts in Demand from Domestic to Foreign Products:* W. S. SALANT. *Some Evidence on the International Price Mechanism:* A. C. HARBERGER. *Strategic Factors in Balance of Payments Adjustment:* E. M. BERNSTEIN.

*The Southern Economic Journal*

VOL. XXIV, No. 3, JANUARY 1958. *Freedom, Economics, and Corporate Organization:* M. S. HEATH. Ceteris Paribus: *Some Notes on Methodology:* J. M. BUCHANAN. *Schumpeter's Views on the Relationship of Philosophy and Economics:* A. F. CHALK. *Interest Rates and Total Spending:* L. B. YEAGER. *Market Structure, Union Power and Inflation:* J. R. SCHLESINGER. *The Bank Holding Company Act of 1956:* B. J. KLEBANER. *Regional Importance of Foreign Trade in Manufactures:* P. J. BOURQUE. *Public Prediction in Theory and Fact:* H. J. LEVIN. *The Role of Economics in Education for Business Administration:* J. P. OWEN.

VOL. XXIV, No. 4, APRIL 1958. *A Theory of Bargaining with Interpersonal Comparisons of Utility:* E. COEN. *The Incidence of Collective Bargaining Once More:* M. BRONFENBRENNER. *The Growth of Union Membership in the South, 1939–53:* L. TROY. *Nationalization, Union Structures, and Wage Policy in the British Coal Mining Industry:* F. MEYERS. *State Regulation of Commercial Motor Carriers in the Southeast:* C. C. CARTER. *Flexibility in Management—a Concept in Economic Decision-making:* J. L. MASSIE. *Government Defense Industrial Activity in Relation to the South:* C. E. MARBERRY.

*The Journal of Economic History*

VOL. XVII, No. 4, DECEMBER 1957. *The Integration of Economic Theory and Economic History: The Interrelation of Theory and Economic History:* W. W. ROSTOW; *Economic Theory, Statistical Inference, and Economic History:* J. R. MEYER and A. H. CONRAD; *Summary of Discussion and Postscript:* S. KUZNETS; *The Role of Comparison in the Development of Economic Theory:* S. L. THRUPP; *Long-period Comparative Study: Some Historical Cases:* W. T. EASTERBROOK; *Summary of Discussion:* H. HEATON.

*Industrial and Labor Relations Review*

VOL. 11, No. 2, JANUARY 1958. *The Histadrut: The General Federation of Jewish Labor in Israel:* M. PLUNKETT. *Labor Relations in Soviet Factories:* E. C. BROWN. *New York's Minimum Wage Law: The First Twenty Years:* I. LUBIN and C. A. PEARCE. *A Measure of the Utilization of Labor in the Economy:* P. W. CARTWRIGHT and R. J. LAMPMAN. *An Interindustry Analysis of Labor's Share:* J. W. BECK. *The CIO Jurisdictional Dispute Experience:* S. H. LEHRER. *The Well-aged Arbitration Case:* A. M. ROSS.

VOL. 11, No. 3, APRIL 1958. *The Taft–Hartley Act after Ten Years: A Symposium. Amending the Taft–Hartley Act: A Decade of Frustration:* B. AARON; *The Impact of the Taft–Hartley Act on Union Strength and Collective Bargaining:* J. SHISTER; *Internal Affairs of Unions and the Taft–Hartley Act:* P. TAFT; *Management Experience under the Taft–Hartley Act:* R. ABELOW; *The Taft–Hartley Experiment in Separation of NLRB Functions:* I. KLAUS; *Federal Pre-emption under the Taft–Hartley Act:* W. J. ISAACSON; *A Summary Evaluation of the Taft–Hartley Act:* C. W. SUMMERS. *Environmental Variables and Union–Management Accommodation:* M. DERBER, W. ELLISON CHALMERS and R. STAGNER. *Joint Industrial Planning in Great Britain:* M. FRANKEL.

*Economic Geography*

VOL. 34, No. 2, APRIL 1958. *A Method for Measuring Change in the Distribution of Manufacturing Activity: The United States, 1939–47:* W. ZELINSKY. *The Changing Pattern of Norwegian Hydroelectric Development:* W. L. RAITT. *The Functional Bases of the Central Place Hierarchy:* B. J. L. BERRY and W. L. GARRISON. *The Suez Canal at Mid-century:* A. B. MOUNTJOY. *Railway Traffic and Agriculture in New Zealand:* W. H. WALLACE.

*The Journal of Accountancy*

VOL. 105, No. 1, JANUARY 1958. *Generally Accepted Accounting Principles:* G. O. MAY. *Challenges in Financial Reporting:* A. R. JENNINGS. *U.S. Tax Policy Objectives:* D. T. SMITH. *A Look at Accounting Legislation:* J. L. O'BRIEN. *Health and Welfare Fund Audits:* P. A. LOCKITCH.

VOL. 105, NO. 2, FEBRUARY 1958. *Accounting in Transition:* W. W. WERNTZ. *Distribution Cost Analysis:* M. SCHIFF. *Partnership Distributions:* E. GERVER. *Audits of Federal Credit Unions:* A. G. HENDRICKS. *Interpreting Reports for Management:* J. W. LAFRANCE.

VOL. 105, NO. 3, MARCH 1958. *A Look at Annual Reports:* N. E. CRANE. *Management Service Referrals:* M. D. BACHRACH. *How Progressive are our Tax Laws?:* J. P. GOEDERT. *Petroleum Products Costing:* C. H. GRIFFIN. *Statistical Inventory Sampling:* R. F. OBROCK. *Staff Training:* S. W. MARCUS.

VOL. 105, NO. 4, APRIL 1958. *Listed and Unlisted Securities:* E. N. GADSBY. *Price-level Depreciation Survey. The Meaning of Auditing Standards:* H. G. BARDEN. *An Accountant Looks at Statistics:* H. P. HILL; *A Statistician Looks at Accounting:* H. B. ARKIN.

*Revue Économique*

VOL. VIII, NO. 4, JULY 1957. *Problèmes Monétaires. Théorie du taux d'escompte et de la balance de comptes:* J. RUEFF. *Efficacité de l'action des autorités monétaires:* E. JAMES. *Les banques face à la politique du crédit:* J. MEYNAUD. *La politique monétaire française:* P. DIETERLEN. *La politique monétaire en Allemagne:* P. COULBOIS. *Le néo-classicisme monétaire aux Etats-Unis:* P. TABATONI.

VOL. VIII, NO. 5, SEPTEMBER 1957. Proceedings of third conference of Association Française de Science Économique. *Qualifications et comportement des salairiés. Les travailleurs non manuels:* J. MARCHAL. *Comportement social et situations économiques:* F. SELLIER. *Les travailleurs manuels:* J. LECAILLON. *Homogénéité du groupe ouvrier:* A. TOURAINE. *Le rôle du syndicalisme:* P. VIGNAUX. *Les revendications syndicales:* J. L. GUGLIELMI.

VOL. VIII, NO. 6, NOVEMBER 1957. *Les Récessions Économiques. Les récessions:* H. GUITTON. *Fluctuations cycliques internationales:* C. P. KINDLEBERGER. *Les récessions françaises:* J. M. JEANNENEY. *Les récessions en Grande-Bretange:* J. MITCHELL. *Les fluctuations cycliques aux Etats-Unis:* D. SHELBY. *Récessions et seuils économiques:* P. L. REYNAUD. *Analyse des récessions économiques:* R. BARRE.

*Revue d'Économie Politique*

VOL. 67, NO. 6, NOVEMBER–DECEMBER 1957. *À la Recherche d'Albert Aftalion:* H. HORNBOSTEL. *Dépréciation du futur et préférence pour la liquidité:* D. VILLEY. *Le concept du plan et la théorie du capital:* A. COTTA. *Les calculs d'agrégats en France antérieurement à 1850:* J. MOLINER.

VOL. 68, NO. 1, JANUARY–FEBRUARY 1958. *Le marché commun et ses problèmes. Une mutation dans les structures politiques: le marché institutionnel des Communautés européennes:* J. RUEFF. *La marché commun dans l'optique européenne:* D. VILLEY. *Etapes de l'Europe:* BARON SNOY ET D'OPPUERS. *Fondements théoriques, perspectives et conditions d'un marché commun effectif:* M. ALLAIS. *Le potentiel du marché commun:* R. DU PAGE. *Les perspectives de la communauté:* P. NAUDIN. *L'adaptation de l'économie française au marché commun:* G. DE CARMOY. *Les problèmes de l'Agriculture:* P. FROMONT. *L'association des pays d'Outre-Mer:* G. LEDUC. *Les problèmes sociaux:* J. TESSIER. *Les distorsions et leur correction:* J. TINBERGEN. *Problèmes d'harmonisation et de coordination des politiques économiques et sociales:* B. OHLIN. *L'échelonnement des mesures de libération et les clauses de sauvegarde:* R. COURTIN. *La zone de libre-échange:* P. URI. *L'Europe et la théorie économique:* H. GUITTON. *Les formes de la concurrence dans le marché commun:* F. PERROUX.

*Revue de Science Financière*

VOL. L, NO. 2, APRIL–JUNE 1958. *Le déficit budgétaire et son financement:* R. STUCKEN. *L'utilisation rationelle des ressources nationales et l'équilibre de la balance des comptes:* A. ARMENGAUD. *Règlements financiers des organisations internationales:* C. A. COLLIARD. *Considérations d'ordre fiscal influant sur les investissements étrangers aux États-Unis:* I. T. WENDER. *Les privilèges fiscaux au sein de la T.V.A.:* J. MONTEIL. *De la discussion budgétaire classique à l'essai de nouvelles procédures:* J. PETOT.

*Économie Appliquée*

VOL. X, NO. 2–3, APRIL–SEPTEMBER 1957. *Croissance économique des nations modernes:* S. KUZNETS. *L'évolution capitaliste à la lumière de l'économie keynésienne:* N. KALDOR. *Profit et croissance économique:* C. L. HARRISS. *La balance commerciale, les termes de l'échange*

*et la croissance économique:* J. BLACK and P. STREETEN. *Échanges extérieurs, profits d'entreprise et gains des nations:* J. WEILLER. *Le profits et la croissance planifiée en économie collectiviste:* T. SURÁNYI-UNGER. *La croissance du capital en U.R.S.S., essai de confrontation critique:* M. RUBEL. *Profit, croissance et stagnation en France au XIX^e siècle:* R. E. CAMERON. *Sur les énergies nouvelles et la croissance: le coût de l'énergie nucléaire et l'analyse théorique du coût:* J. MOULY.

*Journal de la Société de Statistique de Paris*

VOL. 98, NO. 7–8–9, JULY–SEPTEMBER 1957. *Contribution à l'étude des relations entre variables aléatoires faiblement liées:* L. AMY. *Recherches relatives au trafic automobile et aux accidents de circulation:* P. DEPOID.

VOL. 98, NO. 10–11–12, OCTOBER–NOVEMBER–DECEMBER, 1957. *Les Villes d'Occident du XIV^e au XIX^e siècle:* J. BOURDON. *Chronique de production industrielle:* R. SERMAGE. *Une nouvelle méthode pour étudier les relations entre aptitudes:* A. MILHAUD.

*Population*

VOL. 13, NO. 1, JANUARY–MARCH 1958. *Croissance des effectifs scolaires et besoins en maîtres:* R. PRESSAT. *Une enquête sur l'efficacité de l'action sociale des caisses d'allocations familiales:* A. GIRARD and H. BASTIDE. *Tabac et santé publique:* D. SCHWARTZ. *Quelques vues sur le travail féminin non agricole en divers pays:* J. DARIC. *La population des démocraties populaire d'Europe:* J. C. CHASTELAND.

*Annales de Recherches et de Documentation sur la Consommation*

VOL. 3, NO. 4, OCTOBER–DECEMBER 1957. *La Marché de la Chaussure en France, 1956–65:* E. A. LISLE and J. VORANGER.

*Bulletin de l'Institut de Recherches Économiques et Sociales*

VOL. XXIV, NO. 1, JANUARY 1958. *La conjoncture économique de la Belgique:* M. WOITRIN.

VOL. XXIV, NO. 2, MARCH 1958. *Progrès technique et progrès économique en agriculture: France 1830–85, Belgique 1880–1955:* F. HERMAN. *Progrès techniques et économiques dans la culture betteravière 1932–56:* J. P. WAMPACH. *Le diagnostic de conjoncture économique: Examen critique des diagnostics de l'Institut, 1930–57:* O. THÜR.

VOL. XXIV, NO. 3, APRIL 1958. *La conjoncture économique de la Belgique:* L. DUQUESNE DE LA VINELLE.

*Annales de Sciences Économiques Appliquées*

VOL. 15, NO. 5, DECEMBER 1957. *Le problème des stocks de houille excédentaires:* J. GUILMOT. *L'assurance et les risques atomiques:* M. W. BELSER. *Notation du personnel ou "Merit Rating":* D. CARDON DE LICHTBUER. *Le calcul marginal et la compabilité industrielle:* G. DE BODT.

VOL. 16, NO. 1, MARCH 1958. *Charbon, pétrole, énergie nucléaire:* M. MASOIN. *Le cadre actuel des relations industrielles:* H. GÉRIN. *Analyse de la comptabilité de détaillants:* J. DEMEULENAERE. *La méthode des sondages au service des études de marché:* M. JACQUES. *Position de la psychologie appliquée:* A. VIDAL.

*Revue de l'Institut de Sociologie*

NO. 3, 1957. *Propos sur les techniques quantitatives de l'information et politique économique:* F. PERROUX. *La théorie des jeux: une solution au problème du duopole?:* H. VANDER EYCKEN. *Considérations sociologiques sur le régime foncier des Tetela-Hamba dans ses rapports avec la guerre et la structure politique:* L. DE HEUSCH. *Quelques aspects psychologiques de la régression sociale considérés dans leurs rapports avec l'étude des frustrations:* J. BURNIAUX-TAILLIEUD. *Le Mouvement syndical belge dans ses rapports avec la politique:* L. DELSINNE.

NO. 4, 1957. *L'économétrie dans ses rapports avec l'orientation quantitative de la recherche scientifique:* M. ROY. *Contribution à l'étude de la préciosité en France au XVII siècle:* J. LAMEERE. *Groupements professionnels patronaux:* P. GOLDSCHMIDT-CLERMONT. *Orientation et réussite scolaire en rapport avec l'origine sociale des enfants:* S. DE COSTER and G. VANDER ELST. *Enquête dans quelques sixième et huitième primaires des écoles adoptables de l'agglomération bruxelloise:* M. DESAUNOIS, M. SALESSE and M. FLORQUIN.

*Schmollers Jahrbuch*

VOL. 78, NO. 1, 1958. *Der "Juliusturm" im Lichte der Einkommensgleichung:* E. KORNER. *Monetäre Stabilität gegen Vollbeschäftigung: Theorie der säkularen Inflation:* G. BERNÁCER. *Das Prinzip der Arbeit in der Marxschen under in der Gehlenschen Anthropologie:* L. KOFLER.

VOL. 78, NO. 2, 1958. *Die Wirtschaft in Leben und Lehre: Hermann Schumacher und sein Werk:* S. WENDT. *Die wirtschaftliche Struktur des Erwerbslebens der Bundesrepublik im internationalen Vergleich:* H. SPERLING. *Die Dienstleistungen des Staates in der Volkswirtschaftlichen Gesamtrechnung:* D. SCHIELE. *Der Ausgleich der Familienlasten:* F. OETER.

*Jahrbücher für Nationalökonomie und Statistik*

VOL. 169, NO. 5, FEBRUARY 1958. *Voraussetzungen und Grenzen der Kollektivierung landwirtschaftlicher Betriebe:* H. RAUPACH. *Umstrittene Methoden in der Theorie der Abgabeninzidenz und der Steuerwirkungen:* H. C. RECKTENWALD. *Von der doppelten Buchführung zur dynamischen Wirtschaftsbetachtung:* H. BOLZA.

VOL. 169, NO. 6, MARCH 1958. *Raumordnung und marktwirtschaftliche Selbstkoordination:* I. ESENWEIN-ROTHE. *Produktionsstruktur und Wachstum:* E. HELMSTÄDTER.

*Wirtschaft und Statistik*

VOL. 10, NO. 1, JANUARY 1958. *Das Sozialprodukt im Jahr 1957. Wahlbeteiligung und Stimmabgabe nach Geschlecht und Alter:* K. HORSTMANN. *Über den Umfang und die Genauigkeit von Stichproben:* K. SZAMEITAT and S. KOLLER. *Lehrlinge und Anlernlinge:* E. GRALLERT.

VOL. 10, NO. 2, FEBRUARY 1958. *Die Zusammensetzung des Materialverbrauchs der Industriezweige:* W. FLÖTER. *Neuberechnung von Aussenhandelsindices für die Bundesrepublik Deutschland auf der Basis 1954:* K. H. SCHLÜTER.

VOL. 10, NO. 3, MARCH 1958. *Die Verteilung des Volkseinkommens in der Bundesrepublik Deutschland 1950–1956:* H. BARTELS, K. H. RAABE and H. SPILKER. *Das Produktionsergebnis je Beschäftigten in den grossen Bereichen der Volkswirtschaft 1950 bis 1957:* G. FÜRST, K. H. RAABE and H. SPERLING. *Die Entwicklung des Produktionsergebnisses je Beschäftigten, je Arbeiter und je Arbeiterstunde in der Industrie im Jahr 1957:* W. RÜDIGER.

*Zeitschrift für die Gesamte Staatswissenschaft*

VOL. 114, NO. 1, 1958. *Zu Preisers "Q-Gewinnen":* J. NIEHANS. *Professor Krelle's Theory of Income Shares:* D. B. SUITS. *Aufgabenstellungen der linearen Planungsrechnung:* R. HENN. *Mikro- und Makroanalyse als Grundlage wirtschaftspolitischer Entscheidungen:* N. KLOTEN. *Zur Systematik einer allgemeinen Theorie der Wirtschaftsentwicklung:* F. BAERWALD. *Zur Vorausschätzbarkeit von Produktivitätsveränderungen im Wachstumsprozess:* W. G. HOFFMANN. *Das Verhältnis von Theorie und Geschichte bei Joseph A. Schumpeter:* J. WERNER. *Sozialnorm und soziales Wertbild:* V. MÜLLER.

*Vierteljahrshefte zur Wirtschaftsforschung*

NO. 11, 1958. *Zur Konjunkturellen Situation:* I. RIECKENBERG and H. MARTELL. *Volkswirtschaftliche Gesamtrechnung einschliesslich Geldvermögensrechnung für die Bundesrepublik:* F. GRÜNIG. *Zur Entwicklung der Brutto-Anlage-Investitionen der westdeutschen Industrie in den Jahren 1956 und 1957:* R. KRENGEL. *Zur Lage am Tranpfrachtenmarkt unter besonderer Berücksichtigung der deutschen Kohle- und Öleinfuhren:* H. OTTO. *Der sowjetrussische Luftverkehr:* O. v. GAJZÁGÓ.

*Wirtschaftsdienst (in German with English Air Mail Digest)*

VOL. 37, NO. 8, AUGUST 1957. *The New German Law on Cartels. Germany's Re-unification—neither Annexation nor Anschluss. Structural Changes in the Building of Inland Shipping at Hamburg:* H. MORGENBESSER. *Housing in the Soviet Zone since the War.*

VOL. 37, NO. 9, SEPTEMBER 1957. *Germany's Foreign Trade and Economic Equilibrium. Outstanding Achievements of Machine-tool Design:* K. H. GLEITSMANN. *The Effects of the European Economic Community and of the Free Trade Area on the German Engineering Industry:* R. AUDOUARD. *Economic and Social Effects of Automation:* C. KAPFERER.

VOL. 37, NO. 10, OCTOBER 1957. *Economic and Social Tasks Confronting the Third Bundestag. The Debacle of the Coal Prices. The Development and Future Prospects of Petroleum Chemistry:* O. HORN. *The Problem of Deepening the Channel of the Lower Elbe:* F. HENNING.

VOL. 37, NO. 11, NOVEMBER 1957. *The Common Market Starts Off. Current Problems of Germany's External Trade:* J. RICHTER. *State Control of Restrictive Trade Practices:* W. BENISCH. *The Evolution of the Soviet Zone Currency.*

VOL. 37, NO. 12, DECEMBER 1957. *What about the "German Question"? The Effects of the Recent Tariff Reductions on German Imports:* A. PUHLMANN. *Anxieties of the Hamburg Import Trade:* C. HOLZAPFEL. *The Situation in the German Aircraft Industry:* W. LACOSTE. *Expanding the Traditional Sectors of the Economy in Development Countries:* K. BILLERBECK.

### *Allgemeines Statistisches Archiv*

VOL. 44, NO. 1, 1957. *Über die Einheiten zur statistischen Beobachtung von Arbeitsstätten und der mit diesen verbundenen Tatbestände und Merkmale:* G. DENNUKAT. *Zur Problematik der deutschen Strassenverkehrsunfallstatistik:* H. HOSSE. *Die Frage der Überalterung:* E. KERN.

VOL. 44, NO. 2, 1957. *Reform der landwirtschaftlichen Betriebsstatistik:* H. WIRTH. *Die methodische und erkenntnismässige Entwicklung der Erhebung von Wirtschaftsrechnungen:* H. SCHMUCKER. *Zur Einführung einer Krebskrankenstatistik in Österreich:* H. HANSLUWKA.

VOL. 44, NO. 3, 1957. *Wandlung der Denkart und neue Denkformen:* W. BRITZELMAYR. *Induktion:* E. M. FELS. *Induktive Logik und statistische Methode:* O. ANDERSON. *Strategische Spieltheorie und ihre Anwendung in den Sozialwissenschaften:* G. TINTNER. *Der Beitrag der Statistik zum aufbau einer quantitativen, exakten Wirtschaftstheorie:* H. SCHMUCKER.

### *Bayern in Zahlen*

VOL. 11, NO. 12, DECEMBER 1957. *Die Entwicklung des Sozialprodukts in Bayern 1950 bis 1955:* H. SCHMUCKER. *Neue Wege bei der Ermittlung der Anbauflächen:* J. EICHINGER. *Die Bodenbenutzungserhebung in Bayern 1957:* J. EICHINGER. *Die Getreideernte in Bayern 1957:* J. EICHINGER. *Der Maschinenbau in Bayern:* L. LEIBERICH. *Der Fremdenverkehr in Bayern im Sommerhalbjahr:* J. LEIPNER. *Der Finanzausgleich zwischen Land und Gemeinden in Bayern:* J. WIRNSHOFER. *Die Rentner als Mitglieder der sozialen Krankenversicherung in Bayern:* E. SCHMIDT.

VOL. 12, NO. 1, JANUARY 1958. *Der Gemüseanbau in Bayern 1957:* F. ILLNER. *Das veranlagte Einkommen der Einkommensteuerpflichtigen in Bayern 1954:* J. SIEBER. *Das veranlagte Einkommen der Körperschaftsteuerpflichtigen in Bayern 1954:* J. SIEBER. *Der Krankenstand in der sozialen Krankenversicherung in Bayern im 2 Halbjahr 1957:* E. SCHMIDT. *Die Entwicklung der Einzelhandelspreise in Bayern 1957:* G. v. POKORNY. *Die Wohnverhältnisse in Bayern im Herbst 1956:* F. ENGEL. *Repräsentative Sonderauszählung bei der Wahl zum dritten Bundestag am 15 September 1957 nach Geschlecht und Alter in Bayern:* R. SCHACHTNER.

VOL. 12, NO. 2, FEBRUARY 1958. *Die Ausländer in Bayern 1957:* W. MAIER. *Die Apotheken in Bayern 1956:* E. ZIMMERMANN. *Die Verwendung von Mähdreschern in Bayern 1957:* J. EICHINGER. *Die Obsternte in Bayern 1957:* F. HELLER. *Umsätze und Umsatzsteuer in Bayern 1956:* J. SIEBER. *Pflegekinderschutz und Vormundschaftswesen in Bayern:* E. SCHMIDT. *Die Mietwohnungen und ihre Mieten in Bayern im Herbst 1956:* F. ENGEL. *Die Wohnverhältnisse bestimmter Bevölkerungsteile in Bayern:* F. ENGEL. *Die Witterung in Bayern 1957.*

VOL. 12, NO. 3, MARCH 1958. *Bayerns Wirtschaft 1957:* G. v. POKORNY. *Die meldepflichtigen übertragbaren Krankheiten in Bayern 1957:* J. FILSER. *Die Erträge des Futterbaus in Bayern 1957:* F. ILLNER. *Die Viehbestände Bayerns Ende 1957:* J. BUCK. *Der Export des Handwerks in Bayern:* G. BUCHERT. *Die Wohnungsstruktur in Bayern:* F. ENGEL.

### *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*

VOL. 93, NO. 4, DECEMBER 1957. *Feste Endprodukt-Proportionen und stetige Faktor-Substituierbarkeit bei Programmierungen:* W. KRELLE. *Bevölkerungsvorausberechnung in stochastischer Darstellung:* M. FLÜCKIGER. *Paritätsforderung und Agrarpolitik:* J. WERNER. *Rechtsfragen der schweizerischen Statistik:* R. KEHL. *Wettbewerbspolitik und europäische Integration:* E. HEUSS. *La décentralisation de Paris: problèmes économiques, sociaux et financiers:* H. LAUFENBURGER.

VOL. 94, NO. 1, MARCH 1958. *Quelques aspects de la vie économique de Genève à l'époque romaine:* A. BABEL. *Das Werturteil in der Nationalökonomie:* E. BÖHLER. *Die wirtschaftliche Bedeutung der Automation:* T. KELLER. *Neuere Auffassungen über die Umschichtung der Berufe:* A. SCHWARZ. *Wirtschaftsstruktur, Konjunkturanfälligkeit und Krisenfestigkeit:* F. KNESCHAUREK.

*Monatsberichte des Österreichischen Institutes für Wirtschaftsforschung*

VOL. XXX, No. 12, 1957. *Die österreichische Konjunktur an der Jahreswende 1957/58. Die wirtschaftliche Lage auf den enzelnen Gebieten. Der Fremdenverkehr in Jahre 1956/57.*
VOL. XXXI, No. 1, 1958. *Die wirtschaftliche Lage in Österreich. Die Lage auf den einzelnen Wirtschaftsgebieten. Die Bedeutung der amerikanischen Überschussgüter für die österreichische Wirtschaft.*
VOL. XXXI, No. 2, 1958. *Die wirtschaftliche Lage in Österreich. Gesamtschau der österreichischen Wirtschaft im Jahre 1957.*
VOL. XXXI, No. 3, 1958. *Die wirtschaftliche Lage in Österreich. Die Eingliederung der geburtenstarken Jahrgänge in die Wirtschaft.*

*De Economist*

No. 1, JANUARY 1958. *The Economic Development of the Union of South Africa:* H. W. J. WIJNHOLDS. *De werkgelegenheidsvoorspellingen van het Rijksarbeidsbureau:* K. MULDER and E. KAPTEIN. *Opmerkingen en aantekeningen:* A. HEERTJE.
No. 2, FEBRUARY 1958. *Enkele beschouwingen rondom allerlei specialisaties in het economisch onderzoekingswerk:* H. GORIS. *Beschouwingen over de theorie van het monopolie:* A. HEERTJE. *Opmerkingen en aantekeningen:* J. TINBERGEN.
No. 3, MARCH 1958. *De toekomst van de inkomensverdeling:* J. PEN. *Het Amerikaanse onderwijs: I:* H. M. H. A. VAN DER VALK. *De wetsontwerpen Ruimtewet en Woningwet:* H. G. VAN BEUSEKOM.
No. 4, APRIL 1958. *Het Amerikaanse onderwijs: II:* H. M. H. A. VAN DER VALK. *Het kompas voor de kapitaalaanwending:* W. GRIFFIOEN. *De prijsvorming in het bouwbedrijf:* C. T. C. HEYNING.

*Nationaløkonomisk Tidsskrift*

VOL. 95, No. 5–6, 1957. *En Økonomisk Disputats:* J. PEDERSEN. *Produktion og Fordeling: På Arbejdsmarkedet og i den Økonomiske Politik:* A. F. ZEUTHEN. *Danish Long-term Export Contracts and Agricultural Production:* J. C. MURPHY. *Danmark Mellem Norden og "de seks":* K. PHILIP. *Statsfinanserne og Kapitalmarkedet:* V. KAMPMANN.

*Økonomi og Politik*

VOL. 31, No. 3, 1957. *Udviklingen i det offentliges indtægter og udgifter i Danmark siden 1929:* K. HANSEN. *Tr fællesmarkedsplaner:* E. OLSEN.

*Ekonomisk Tidskrift*

VOL. LX, No. 1, APRIL 1958. *Finanspolitik och budgetprognoser:* I. SVENNILSON. *Kvantitetsteorins plats i den aktuella penningteoretiska diskussionen:* B. KRAGH. *Samhällsekonomisk programmeringsanalys:* L. WERIN.

*Skandinaviska Banken Quarterly Review*

VOL. 39, No. 1, JANUARY 1958. *Sweden and the Plans for Economic Integration:* G. CEDERWALL. *Consumption in Sweden 1931–1965:* R. BENTZEL. *The Government Price and Cartel Board:* H. OLSSON.

*Ekonomiska Samfundets Tidskrift*

VOL. 11, No. 1, 1958. *Kreditmarknadens förbistring:* G. STJERNSCHANTZ. *Arbetslöshetens paradox i den klassiska nationalekonomin:* L. O. AF HEURLIN. *Undersysselsättningen, dess definition och mätbarhet:* E. ELFVENGREN. *Mätning och jämförelse av interpersonlig tillfredsställelse:* O. HENELL.

*Liiketaloudellinen Aikakauskirja (Finnish text, English summaries)*

VOL. 6, No. IV, 1957. *On the Concept and the Measurement of Insurance Saving:* J. LINNAMO. *Recent Development of the Monetary Interest Theory:* K. PELTOLA.
VOL. 7, No. 1, 1958. *The Taxes in Investment Calculations and their Influence on the Length of the Investment Period:* M. SAARIO. *Pricing: Routine or Active Market Policy?:* J. PAAKKANEN. *The Financial Budget:* I. LAMPPU. *Analysis of the Demand for Sweets on the Finnish Market for the Years 1921–56:* E. RAILO.

### *Giornale Degli Economisti e Annali di Economia*

VOL. XVI, NO. 9–10, SEPTEMBER–OCTOBER 1957. *Sull'indirizzo scientifico di Benvenuto Griziotti:* E. D'ALBERGO. *A proposito dello sviluppo economico e della connessione fra sviluppo e guerra:* A. SCOTTO. *Le nuove tavole di mortalità e di sopravvivenza per l'Italia:* G. MORTARA. *Su una bibliografia del socialismo:* L. DAL PANE. *In tema di frammentazione e dispersione della proprietà e dell'impresa:* V. RICCHIONI. *L'aggregazione nella tavola delle interdipendenze strutturali:* P. CASTIGLIONI.

VOL. XVI, NO. 11–12, NOVEMBER–DECEMBER 1957. *L'opera scientifica di Rodolfo Benini:* M. BOLDRINI. *Contributo alla determinazione del saggio ottimo di risparmio pubblico e privato in una comunità:* E. GERELLI. *Nuove lettere inedite di Vilfredo Pareto:* T. GIACALONE-MONACO. *Attualità di Francesco Ferrara:* F. FRISELLA VELLA. *Cavour e il problema economico-finanziario della seconda guerra d'indipendenza:* M. GIORDA.

### *Rivista Italiana di Economia Demografia e Statistica*

VOL. XI, NO. 1–2, JANUARY–JUNE 1957. *Qualche cenno sulle nuove o quasi nuove ricerche della criminologia dal principio del secolo ad oggi:* A. NICEFORO. *Per la inaugurazione di due corsi di carattere tecnico:* L. MAROI. *Natura, metodi e organi della ricerca operativa:* B. BARBERI. *Sui limiti dell'errore che si puo commettere nel calcolo del premio di una generica assiscurazione per effetto della variazione di una base tecnica entro confini assegnati:* M. A. COPPINI. *Sulla stima campionaria delle proporzioni in presenza di unità non classificabili:* L. DE LUCIA. *Interventi pubblici nel settore di distribuzione dei prodotti agricoli:* G. G. D'ARAGONA. *Un tentativo di determinazione di un semplice distributore demografico nella dinamica delle nascite primogenite:* N. TITOLO. *Sull'andamento stagionale della febbre tifoide in provincia di Bari:* G. GUERRIERI. *Intorno ad uno schema generale relativo al problema delle prove ripetute con probabilità dipendenti:* A. PREDETTI. *Sulla difficoltà di indicare un reale progresso dell'economia italiana:* L. ISGRÒ.

### *Economia Internazionale*

VOL. X, NO. 4, NOVEMBER 1957. *Aree depresse e cultura sociale:* A. BERTOLINO. *Sulla determinazione della distribuzione temporale della quantità da produrre e della durata di un impianto produttivo:* E. GERELLI. *The Supply of Finance and the Theory of Investment of the Firm:* C. SEGRÉ. *Input–Output Analysis the Entrance to Efficient Economics?:* F. ZEUTHEN.

### *Banca Nazionale del Lavoro Quarterly Review*

NO. 44, MARCH 1958. *Cost- and Demand-induced Inflation:* F. A. LUTZ. *The Canadian Money Market Experiment:* J. S. G. WILSON. *Bank Rate or Forward Exchange Policy:* A. E. JASAY. *The American Consumer: A Financial Portrait:* H. H. LANDSBERG.

### *L'Industria*

NO. 3, 1957. *Predizione e profezia nelle scienze sociale:* K. POPPER. *Tramonto dell'indirizzo Paretiano–Hicksiano delle curve d'indifferenza?:* A. PREDETTI. *Forme quadratiche (o hermitiane) subordinati forme definite o semidefinite:* S. CHERUBINO. *La teoria dei giochi, la programmazione lineare e l'analisi delle interdipendenze strutturali:* G. TINTNER.

### *Review of the Economic Conditions in Italy (Banco di Roma)*

VOL. XII, NO. 1, JANUARY 1958. *Monetary Imbalances and Paradoxes:* C. BRESCIANI TURRONI. *Government Telephone Services:* G. SCANGA. *The Italian State Railways:* G. TROTTA.

VOL. XII, NO. 2, MARCH 1958. *Evolution of the Capitalist System and Adjustment of Credit Functions:* G. PALOMBA. *Italian Economy in 1957:* L. MAGNANI. *Foreign Travel in Italy in 1957:* F. FAZIO.

### *Italian Affairs*

VOL. VII, NO. 1, JANUARY 1958. *The Parliamentary Enquiry into Labour Conditions. Migration in 1956. Agriculture in 1956. The Automobile Industry. The Petroleum Industry. Coal. Tourism and its Contribution to Italian Economy.*

*Economia Internazionale delle Fonti di Energia*

VOL. 1, NO. 1, SEPTEMBER–OCTOBER 1957. *L'O.E.C.E. e la collaborazione europea nel campo dell'energia:* J. A. VAN DEN HEUVEL. *Il probabile sviluppo del fabbisogno di energia nella Germania occidentale dal 1956 al 1965:* T. WESSELS. *Contributo allo studio dei costi dell'energia elettronucleare:* L. GUATRI.

*Metroeconomica*

VOL. IX, NO. 2, AUGUST 1957. *Sur un problème d'économie pure:* R. FRISCH. *How Surprising is a Chain of Coincidences?:* W. M. GORMAN. *Voluntary and Forced Decisions:* H. R. PARKER. *" Common Sense " as a Cross-check for Mathematics:* J. SPRAOS; *A Comment:* H. R. PARKER. *Per una teoria pura delle communicazioni:* E. FOSSATI.

VOL. IX, NO. 3, DECEMBER 1957. *The Pricing Policies of a Spatial Monopolist:* M. L. GREENHUT and R. W. PFOUTS. *Some Comments on Professor Hicks' Revision of Demand Theory:* W. M. GORMAN. *Selling Outlays in the Theory of International Trade:* A. Y. C. KOO. *A Supplementary Note to " On the Classical Multilateral Exchange Problem ":* H. NIKAIDÔ.

*The Annals of the Hitotsubashi Academy*

VOL. VIII, NO. 1, OCTOBER 1957. *On Inherent Defect of the Subject-matter Insured:* Y. KATO. *On Biases of the Price-deflator:* R. IOCHI. *Changes over Time of Production and Added Value:* I. YAMADA. *The Problem of Economic Backwardness and the History of Economic Development:* Y. ITAGAKI. *The Character of the Feudal Society in Japan:* T. TOYODA.

*Osaka Economic Papers*

VOL. VI, NO. 12, SEPTEMBER 1957. *Ricardo, Marx, Keynes and the Relationship between Wage Rate and Prices:* H. KUMAGAI. *Productivity Growth and Trade Balance:* M. TATEMOTO. *Der Betriebsausschuss in Japan:* T. HIRATA. *The Reform of the Monetary System in the Early Years of Meiji:* Y. SAKUDO. *Le progrès et l'activité de l'étude de l'histoire économique du Japon:* M. MIYAMOTO.

*Asian Affairs*

VOL. 11, NO. 2, JUNE 1957. *Japan's Small Business. Japanese " Small–Medium " Business and Optimum Size:* T. YAMANAKA and K. TAKIZAWA. *Management Structure of Small and Medium Enterprises:* K. FUJITA. *Productivity and Wage Problem of Japan's Medium and Small Manufacturing Enterprises:* T. MINOGUCHI. *Japan's Smaller Enterprises and Financial Problems:* M. SEKI. *Administration for Development of Smaller Industries in Japan:* T. KAWAKAMI. *Medium and Small Enterprises and Vocational Training in Japan. Statistical Analysis of Medium and Small Enterprises in Japan.*

*Moneda y Credito*

NO. 63, DECEMBER 1957. *Inflación y desarrollo económico:* G. HABERLER. *Algunos aspectos de las relaciones del Banco de emisión y de los Bancos comerciales con el Estado:* H. J. ABS. *Notas y comentarios sobre los orígenes de la industria española del nitrógeno:* F. BUSTELO. *La Banca española en 1956:* I. C. GARRIGÓS.

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*Boletin de Estudios Economicos*

VOL. XII, NO. 42, SEPTEMBER–DECEMBER 1957. *La politica estatal sobre beneficios a la luz de una teoria realista del beneficio:* J. E. DE BLAS. *Los movimientos de fondos y la contabilidad nacional:* J. M. DE A. ZURRIARAIN. *" Muestreo de Trabajo ":* J. J. H. ALEIXANDRE. *Investigacion operativa: Colas o lineas de espera:* R. P. CHACÓN.

### *L'Egypte Contemporaine*

Vol. XLVIII, No. 290, October 1957. *La qualification juridique de la Corruption en Droit Egyptien:* A. R. Khafagui. *Facteurs monétaires affectant la stabilité économique:* G. Haberler. *Mining, quarrying and petroleum industries in Egypt.*

### *Economic Bulletin of the National Bank of Egypt*

Vol. X, No. 4, 1957. *Some Changes of the Climate. The 1954 Census of Industrial Production. Egypt's Balance of Payments Estimates, January–September 1957.*

### *Voprosy Ekonomiki (Russian text)*

No. 10, 1957. *The Victory of Socialism in the U.S.S.R. and the Creation of the Socialist System of the World Economy:* K. Ostrovityanov. *The Growth of the Socialist Economy and the Main Economic Task of the U.S.S.R.:* L. Leontiev. *Fraternal Co-operation and the International Division of Labour in the World Socialist Camp:* V. Kaigl. *The Electrification of the U.S.S.R. over 40 years:* V. Veits. *The Development of Socialist Industry over 40 Years:* L. Volodarsky. *The Location of Productive Resources in the U.S.S.R.:* Ya. Feigen. *Radical Changes in the Material and Cultural Welfare of the Soviet Peasantry:* M. Moiseev. *The Achievements of Socialist Agriculture over 40 Years:* N. Shabalin. *The Rise in the Welfare of the Workers of the U.S.S.R.:* I. Lvov. *In the Struggle for an Abundance of Food:* I. Sivolap. *Soviet Trade and the Growth of Personal Consumption:* G. Dikhtyar. *The Socialist Economy and Culture over 40 Years:* P. Golubkov. *Documents on Economic Problems from the Earliest Years of Soviet Power:* N. Karotamm.

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### *Planovoe Khoziaistvo (Russian Text)*

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### *Finansy S.S.S.R. (Russian text)*

No. 9, 1957. *In Every Way Support the Housing Drive. Raise the Level of Organisational and Economic Work of Financial Organs:* A. Zverev. *The Reorganisation of Building Management and the Tasks of the Industrial Bank:* P. Podshivalenko. *Tighten the Relations between the*

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*Dengi i Kredit* (*Russian text*)

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*Vestnik Statistiki* (*Russian text*)

No. 4, 1957. *Towards New Successes in Building Communism. The All-Union Conference of Statisticians: Speeches by V. N. Starovsky on the Functions of Statistics Arising from the Reorganization of Industry; by P. G. Podyachich on Planning the 1959 Census; by V. A. Sobol on the Methology of National Accounting; Debates and Resolutions.*

No. 5, 1957. *The Great October Socialist Revolution. V. I. Lenin and Soviet Statistics:* T. RYABUSHKIN. *The Historic Victories of the Socialist Economy:* L. VOLODARSKY and S. GUREVICH. *Soviet Statistics on the Fortieth Anniversary of the Great October Socialist Revolution:* N. RYAUZOV. *On the History of the Organisation of Local Statistical Bodies in the Early Years of Soviet Power:* S. GADZHIEV. *The Anti-popular Theory of "Popular Capitalism":* L. ALTER. *On Training Statisticians in the U.S.S.R.:* N. POMPEEV. *International Conference of Labour Statisticians: T.R. Report on the Lecture of Professor Mahalonobis at the Central Statistical Administration of the U.S.S.R.:* L. L.

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*Ekonomista (Polish text, English and Russian summaries)*

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*Gospodarka Planowa (Polish text)*

DECEMBER 1957. *Prices and Profits in State Industrial Enterprises:* Z. MADEJ. *What Should Be the Main Changes in Internal Trade?:* M. SONIEWSKI. *The Influence of Accumulation on the Level of Consumption in Long-range Planning:* M. RAKOWSKI. *A Comment:* J. PAJESTKA. *Input–Output Tables as an Instrument of Co-ordination in Economic Planning:* K. PORWIT. *Trends in World Steel Production, 1956–1960:* J. GWIAŹDZIŃSKI. *Problems of Price-fixing in the U.S.S.R.:* I. MAIZENBERG. *Yugoslav Economic Policy:* S. VUKMANOVIĆ. *Reorganisation of the Economy of the German D.R.:* K. KRASZEWSKI. *Economic Trends in the United States after the 1953/4 Recession:* A. SZEWORSKI. *Productivity as a Form of Economic Accounting:* H. WITKOWSKI.

JANUARY 1958. *First Conclusions to be Drawn from the Realisation of the 1957 Agrarian Programme. Investments and the Growth of the National Income:* M. RAKOWSKI. *Private Enterprise in Our Economic System—its Tasks and Importance:* I. CHODAK. *Some Problems of Private Trade Development:* Z. LEWANDOWSKA. *Is Our Metallurgy Too Capital-intensive?:* R. WILCZEWSKI. *The New Long-term Expansion Programme for the Polish Lignite Industry:* A. STRZEMIŃSKI. *The Current State of Industrial Statistics:* I. ISZKOWSKI and S. PARADISZ. *Retail Trade Statistics:* A. MACHNOWSKI. *Yugoslavia's Five-year Plan:* B. BALIŃSKI. *New Methods of Economic Management in the Chinese People's Republic:* M. H. *Some Ways of Comparing Living Standards between Countries:* S. MIKOŁAEWSKA. *Cost Accounting and Workers' Self-management in State Farms:* T. WYSZOMIRSKI.

*Planované Hospodářství (Czech text)*

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*Planovo Stopanstvo (Bulgarian text)*

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*Ikonomicheska Misl* (*Bulgarian text, French and Russian summaries*)

No. 5, 1957. *Under the Victorious Sign of the Great October Socialist Revolution. The Soviet Union on the Road to Socialism:* K. LAZAROV. *The Great October Socialist Revolution and the Building of a Bulgarian Socialist Economy:* E. MATEEV. *Economic Competition between Capitalism:* E. KAMENEV. *The Great October Socialist Revolution and the Break-up of the World System of Capitalism:* YA. ATANASSOV. *Lenin's Views on Co-operatives and their Influence on the Development of the Bulgarian Co-operative Movement:* S. YANEV.

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*Statistikai Szemle* (*Hungarian text, English and Russian summaries*)

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*Probleme Economice (Rumanian text, French and Russian summaries)*

No. 11, 1957. *The Production Council—an Important and Efficient Form of Mass Participation in the Direction and Administration of Socialist Enterprises:* C. BĂRBULESCU and D. TOIŢA. *The Development of Metallurgy in the Years of Popular Power:* H. SERIAN. *A Contribution to the Study of the Infiltration of and Domination by Foreign Capital in Rumanian Forestry in the Period of the Relative Stability of Capitalism:* V. AXENCIUC. *The Way of the October Revolution and National Peculiarities in Building Socialism:* C. MURGESCU. *For the Improvement of the Finance and Planning System in Investment:* R. SĂVEANU. *Some Problems of Stockbreeding:* N. CORNĂTEANU. *Some Aspects of Jugoslav Progress Along the Road to Socialism:* V. RAUSSER. *Recent Trends in Economic Theory in Britain and the U.S.A.:* M. DOBB. *Some Aspects of the Action of the Law of Value under Socialism:* I. RACHMUTH. *On the Economic Development of Tunisia:* F. TUDOR.

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# NEW BOOKS

## *British*

ALLEN (E.), ODBER (A. J.) and BOWDEN (P. J.). Development Area Policy in the North East of England. Newcastle upon Tyne: North East Industrial and Development Association (9 Eldon Square, Newcastle upon Tyne, 1), 1957. 8½″. Pp. 95. 5*s*.

[This report was commissioned by the North East Industrial and Development Association, but the views expressed are those of the authors, not necessarily those of the Association. It contains a general survey of Development Area policy in the North East since the War and a more detailed account of the experience of new establishments there, based on the answers to a questionnaire. Many of the findings will be of interest not only to those concerned with the problems of the North East, but also to students of location policy generally. This applies particularly to the chapter on the scope and limitations of Development Area policy. It appears that in general few of the firms that are new to the North East have suffered significant cost disadvantages from their location. There are, however, differences between industries and also between districts. The authors are critical of the Board of Trade's policy of taking relative unemployment levels as the overriding criterion in deciding which particular places within a Development Area to encourage firms to set up in.]

ALLEN (G. C.). Japan's Economic Recovery. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 9″. Pp. xi + 215. 25*s*.

[To be reviewed.]

BAILEY (F. G.). Caste and the Economic Frontier. A village in highland Orissa. Manchester: Manchester University Press, 1957. 9″. Pp. xvi + 292. 35*s*.

[This is a book by a social anthropologist about a remote hill-village in the Kondmals area of western Orissa, in India. The aboriginal Kond population of this area had already in pre-British

times been subject to the intrusion of more sophisticated Oriya plainsmen, but till the coming of British administration its villages had been influenced very little by the State or by commerce. Mr. Bailey is particularly concerned with the effects of the inclusion of his previously self-sufficient village within the "economic frontier," that is, within a commercial economic system; these effects include the break-up of the joint-family system, the buying and selling of land, and the rise of previously lowly castes who had newly acquired wealth.]

CARTER (C. F.), MEREDITH (G. P.) and SHACKLE (G. L. S.) (Eds.). Uncertainty and Business Decisions. A symposium. Second, revised and enlarged edition. Liverpool: Liverpool University Press, 1957. 9″. Pp. x + 158. 22*s.* 6*d.*

[The first edition of this book was reviewed by M. J. Farrell in the ECONOMIC JOURNAL of March 1956, p. 129. This second edition contains four additional contributions: "Decisions and Uncertainty," by J. W. N. Watkins; "Shackle's Φ-function and Gambler Indifference Map," by B. R. Williams; "The Modular Theory of Expectation," by G. P. Meredith; and "The Present State of the Theory of Decisions under Uncertainty," by C. F. Carter. The last two of these have not previously been published.]

CLEMENTS (R. V.). Managers. A study of their careers in industry. London: Allen & Unwin, 1958. Pp. 200. 20*s.*

[To be reviewed.]

COULDERY (F. A. J.) and SHEPPARD (A. J. G.). Your Business Matters. London: John Murray, 1958. 7½″. Pp. vii + 236. 12*s.* 6*d.*

[This is intended as a guide to certain more general aspects of business management for the small trader who is familiar with the technicalities of his own particular line. It deals with legal questions, accounting procedures, taxation, credit, etc.]

DAVIES (R. W.). The Development of the Soviet Budgetary System. London: Cambridge University Press, 1958. 9½″. Pp. xxi + 373. 45*s.*

[To be reviewed.]

DENMAN (D. R.). Origins of Ownership. A brief history of land ownership and tenure from earliest times to the modern era. London: Allen & Unwin, 1958. 9″. Pp. 190. 22*s.* 6*d.*

[To be reviewed.]

ERHARD (L.). Prosperity through Competition. The economics of the German miracle. Translated from the German by E. T. Roberts and J. B. Wood. London: Thames & Hudson, 1958. 9″. Pp. xii + 260. 25*s.*

[To be reviewed.]

GILLMAN (J. M.). The Falling Rate of Profit. Marx's law and its significance to twentieth-century capitalism. London: Dobson, 1958. 9″. Pp. xi + 172. 25*s.*

[To be reviewed.]

GUILLEBAUD (C. W.). The Wages Councils System in Great Britain. An Economic Monograph. London: Nisbet, 1958. 8½″. Pp. 31. 2*s.* 6*d.*

[Reviewed in this issue.]

HABER (L. F.). The Chemical Industry during the Nineteenth Century. A study of the economic aspect of applied chemistry in Europe and North America. London: Oxford University Press, 1958. 9½″. Pp. x + 292. 45*s.*

[To be reviewed.]

HAGUE (D. C.) (Ed.). Stability and Progress in the World Economy. The first Congress of the International Economic Association. London: Macmillan, 1958. Pp. xv + 267. 25*s.*

[To be reviewed.]

HARROD (R. F.). International Economics. Fourth Edition. Cambridge Economic Handbooks. London: Nisbet and Cambridge University Press. 1957. 7½″. Pp. xiii + 186. 8*s.* 6*d.*

[Reviewed in this issue.]

JACKSON (R. M.). The Machinery of Local Government. London: Macmillan, 1958. 9″. Pp. xii + 360. 30*s*.

[To be reviewed.]

JONES (F. C.). Hokkaido. Its present state of development and future prospects. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 9″. Pp. 146. 21*s*.

[To be reviewed.]

KENDALL (M. G.). A Course in Multivariate Analysis. Griffin's Statistical Monographs and Courses, No. 2. London: Charles Griffin (42 Drury Lane, W.C.2), 1957. 8½″. Pp. 185. 22*s*.

[The second volume in this new series of monographs provides a very valuable outline course in Multivariate Analysis, being based on lectures originally delivered by Professor Kendall in 1954. Economic statisticians are likely to be particularly interested in the chapters dealing with component analysis, the problem of estimating a functional relationship and canonical analysis. An historical chapter and a very extensive bibliography are also valuable features of this work.]

KENNAN (G. F.). Russia, the Atom and the West. London: Oxford University Press, 1958. 7½″. Pp. 120. 10*s*. 6*d*.

[This contains the author's celebrated 1957 Reith Lectures. A seventh lecture is added on Anglo-American relations. This was originally intended to be the last lecture in the series, but it was omitted from the broadcasts to make room for discussion of other more urgent topics.]

LYLE (P.). Regression Analysis of Production Costs and Factory Operations. Third Edition, revised by L. H. C. TIPPETT. Edinburgh and London: Oliver & Boyd, 1957. 9″. Pp. 204. 16*s*.

[This is a posthumous re-issue of a book originally published in 1944, which in turn was derived from a privately published booklet circulated in the sugar-refining industry. The editor has interpolated some comments and contributed a cautious preface indicating that " the statistical techniques of regression analysis are expounded in somewhat fuller detail than . . . is necessary for the purpose in hand."]

MACKIE (J.) and WALSTON (H.). Land Nationalisation, For and Against. Fabian Tract No. 312. London: The Fabian Society (11 Dartmouth Street, S.W.1.), 1958. 8½″. Pp. 19. 1*s*. 6*d*.

[Mr. Mackie is for, on account of various deficiencies in the present structure of land tenure in Britain; Mr. Walston is against, on the grounds that the main social and economic weaknesses in British agriculture are not of the sort that land nationalisation would cure and on the grounds also of shortage of administrators. Mr. Walston, however, favours limited acquisition by the State of agricultural land where it is thought to be in the interests of increased production. Both authors raise a number of interesting points, but it cannot be said that either the merits or the defects of the present system of land tenure emerge from their discussion quite as clearly as might be wished.]

MARTIN (A.). Restrictive Trade Practices and Monopolies. London: Routledge & Kegan Paul, 1957. 9″. Pp. xii + 264. 30*s*.

[This is a legal guide to the provisions of the Restrictive Trade Practices Act of 1956, intended for the use of those who may be affected by it and their professional advisers. A brief account is also included of the legislation of 1948, as it stands after the changes introduced in 1956.]

MOSER (C. A.). Survey Methods in Social Investigation. London: Heinemann, 1958. 9″. Pp. xiii + 352. 35*s*.

[To be reviewed.]

MYRDAL (G.). Value in Social Theory. A selection of essays on methodology edited by P. P. STREETEN. In the International Library of Sociology and Social Reconstruction. London: Routledge & Kegan Paul, 1958. 9″. Pp. xlvi + 269. 32*s*.

[To be reviewed.]

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH. 15th Annual Report, 1957. London: National Institute of Economic and Social Research (2 Dean Trench Street, Smith Square, S.W.1), 1958. 10″. Pp. 36.

[This report contains an outline account of the National Institute's new plans for continuous research work on current trends in the economy, as well as a survey of the various projects currently in hand and recently completed.]

NEF (J. U.). Cultural Foundations of Industrial Civilization. London: Cambridge University Press, 1958. 9″. Pp. xv + 164. 20*s*.

[To be reviewed.]

POPPER (K. R.). The Poverty of Historicism. London: Routledge & Kegan Paul, 1957. 9″. Pp. xi + 166. 16*s*.

[To be reviewed.]

QUENOUILLE (M. H.). The Analysis of Multiple Time-Series. Griffin's Statistical Monographs and Courses, No. 1, under the general editorship of M. G. KENDALL. London: Griffin (42 Drury Lane, W.C.2), 1957. 8½″. Pp. 105. 24*s*.

[This is an original research study on a topic of great importance to economic statisticians. It is concerned with the problem of estimating the auto-correlation structure of systems of time series. While Mr. Quenouille provides no easy way out of our present small sample difficulties, he does help to illuminate their causes and suggests improved ways of dealing with them. In the early part of the monograph elegant methods of determining the theoretical auto-correlation structure of a broad class of multiple time series are developed. The combination of theoretical and empirical treatment is reminiscent of Professor Kendall's *Contributions to the Study of Oscillatory Time-Series*.]

ROBBINS (L.). Robert Torrens and the Evolution of Classical Economics. London: Macmillan, 1958. 9″. Pp. xiii + 367. 36*s*.

[To be reviewed.]

ROBERTSON (SIR DENNIS). Lectures on Economics Principle, Volume II. London: Staples, 1958. 8″. Pp. 162. 16*s*.

[To be reviewed.]

SARGENT (J. R.). British Transport Policy. London: Oxford University Press, 1958. 7½″. Pp. ix + 164. 15*s*.

[To be reviewed.]

STRAUSS (E.). Common Sense about the Common Market. Germany and Britain in post-war Europe. London: Allen & Unwin, 1958. 9″. Pp. 168. 15*s*.

[To be reviewed.]

STURMEY (S. G.). The Economic Development of Radio. Industrial Innovation Series. London: Gerald Duckworth, 1958. 8½″. Pp. 284. 30*s*.

[To be reviewed.]

THOMAS (B.) (Ed.). Economics of International Migration. Proceedings of a conference held by the International Economic Association. London: Macmillan, 1958. 9″. Pp. xiii + 502. 45*s*.

[To be reviewed.]

TOWNSEND (P.). The Family Life of Old People. Institute of Community Studies, Report No. 2. London: Routledge & Kegan Paul, 1957. 9″. Pp. xvi + 284. 30*s*.

[To be reviewed.]

VAIZEY (J.). The Costs of Education. London: Allen & Unwin, 1958. 9″. Pp. 256. 30*s*.

[To be reviewed.]

WICKSELL (K.). Selected Papers on Economic Theory. Edited with an Introduction by ERIK LINDAHL. London: Allen & Unwin, 1958. 9″. Pp. 292. 30*s*.

[To be reviewed.]

WRAY (MARGARET). The Women's Outerwear Industry. Industrial Innovation Series. London: Duckworth, 1958. 8½″. Pp. 318. 30*s*.

[To be reviewed.]

## *Australian*

DAVIDSON (F. G.). The Industrialization of Australia. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 8½″. Pp. 26. 3*s.* 6*d.*

[Mr. Davidson is a Lecturer in Economics at the University of Melbourne. A large part of this pamphlet is devoted to a useful and quite detailed survey of the structure of manufacturing industry in Australia, with special attention to problems of monopoly and competition and to the degree of overseas ownership and control. In his more general concluding discussion Mr. Davidson considers the various motives that have underlain Australia's drive to industrialise and states the arguments that have been brought against it, mainly on grounds of cost. His own view is not emphatically expressed, but it is apparent that he does not feel great misgivings about the way things have developed. While by no means denying that attention must be paid to agricultural improvements, he doubts whether a great increase in Australian agricultural production is desirable and whether, if it were, it would absorb a great amount of labour. Industrialisation is therefore the natural course.]

WILLIAMS (D. B.). Economic and Technical Problems of Australia's Rural Industries. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 9″. Pp. 146. 27*s.* 6*d.*

[This book has grown out of a review of Australian agricultural production and price policies which the author was asked to prepare for the International Conference of Agricultural Economists. He describes the structure of Australian agriculture and its prospects in the context of the present-day world economy and in the context also of general Australian economic policy. A large part of the book is devoted to more technical questions about means of improving the efficiency of Australian agriculture.]

WOODRUFF (W.) and MCGREGOR (L.). The Suez Canal and the Australian Economy. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 8¼″. Pp. 20. 2*s.* 6*d.*

[This pamphlet was stimulated by the Suez crisis and appears to have been written while the canal was still closed. The authors give a well-documented survey of the history of the canal and the movement over time of the volume of traffic through it, with special reference to traffic to and from Australia. Data are given of the proportions of different classes of Australian merchandise trade passing through the canal. The concluding section deals with the effects which the closing of the canal had on the Australian economy.]

## *Indian*

JATHAR (G. B.) and (K. J.). Indian Economics. Bombay and London: Oxford University Press, 1957. 10″. Pp. xv + 479. 21*s.*

[This is a shorter and more up-to-date version of the two-volume *Indian Economics*, by G. B. Jathar and S. G. Beri. It includes a chapter on the two Five Year Plans, and will be useful as an elementary introduction to the subject. The treatment of most topics is too cursory for the serious student.]

KHAN (M. S.). Schumpeter's Theory of Capitalist Development. Aligarh: Muslim University, 1957. 10″. Pp. viii + 175.

[The author's purpose is to relate Schumpeter's theory to the writings of other economists, especially Wieser, Boehm Bawerk, Walras and Marx, and to post-Keynesian theories of growth and fluctuations. He writes clearly and shows a good knowledge of the literature he discusses. His own criticism of Schumpeter, from the standpoint of one interested in the problems of under-developed countries, is that in stressing the role of enterprise Schumpeter did not sufficiently analyse the social and other conditions in which the spirit of enterprise is most likely to flourish.]

MEHTA (M. M.). Structure of Indian Industries. Bombay: Popular Book Depot, 1955. 10″. Pp. 340. Rs. 22/8.

[This is a statistical study of the size, location and integration of industrial units of seven Indian industries: cotton, jute, sugar, iron and steel, coal, paper and cement. A great deal of quantitative information is given on changes in the size of industries, on size–cost relationships and on regional variations in costs and profits. The section on integration is especially useful for the light it throws on the managing-agency system. The domination of Indian industry by a small number of British and Indian managing agents is clearly shown.]

RAMA SASTRI (J. V. S.). Nationalization and the Managerial Role. A theoretical study. Bombay: The Popular Book Depot, 1957. 9″. Pp. 119. Rs. 6.

[The author's central thesis is that under nationalisation, as it has been practised in Britain and elsewhere, the function of management undergoes a significant dilution or "truncation," because of the presence of a higher political control above the immediate management. This truncation of the function of management he holds to be potentially dangerous in a country such as India, where industrial development is heavily dependent on managerial initiative.]

RANGA (N. G.). Credo of World Peasantry. Nidubrolu, Andhra: Indian Peasants' Institute, 1957. 8½″. Pp. xvi + 504. Rs. 7/50.

[This is an exposition of the author's views on the exploitation of peasants by capitalists and imperialists, and a plea for better organisation of the peasant class on the lines of the International Peasant Union. The theme of the book is, in the author's words, "Peasants of the World, Unite!"]

## *Ceylonese*

SURIYAKUMARAN (C.). The Economics of Full Employment in Agricultural Countries. With special reference to India and Ceylon. Colombo: K. V. G. De Silva, 1957. 9″. Pp. 307. Rs. 12/50.

[This book is in four parts. The first includes an assessment of the relevance of existing employment theory for underdeveloped agricultural countries. In the second part the case for planned economic development, especially industrialisation, is argued. Part three considers the particular employment and planning problems of India and Ceylon, and in the fourth part international aspects are discussed. The author's policy for full employment contains many of the features of the Indian five-year plans which appeared after most of this book was written. It is unfortunate that their experience was not available to him. There is no index.]

## *American*

BAUER (P. T.). Economic Analysis and Policy in Underdeveloped Countries. Durham, North Carolina: Duke University Press for the Duke University Commonwealth-Studies Center, 1957 (London: Cambridge University Press, 1958). 8″. Pp. xiii + 145. 22*s.* 6*d.*

[To be reviewed.]

BEACH (E. F.). Economic Models. An exposition. New York: John Wiley (London: Chapman & Hall), 1957. 9½″. Pp. xi + 227. 60*s.*

[To be reviewed.]

BECKER (G. S.). The Economics of Discrimination. Chicago: University of Chicago Press (London: Cambridge University Press), 1957. 9″. Pp. x + 137. 26*s.*

[To be reviewed.]

BELLMAN (R.). Dynamic Programming. A Rand Corporation Research Study. Princeton, New Jersey: Princeton University Press, 1957 (London: Oxford University Press, 1958). 9½″. Pp. xxv + 342. 42*s.*

[To be reviewed.]

BRIGHT (J. R.). Automation and Management. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey & Swinfen), 1958. 11¼″. Pp. xv + 270. 80*s.*

[To be reviewed.]

BROWN (J. D.) and HARBISON (F.). High-Talent Manpower for Science and Industry. An appraisal of policy at home and abroad. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1957. 9″. Pp. 97. $3.00.

[Mr. Brown writes on problems of recruiting and developing talent in industry in the United States. He deals in turn with the roles of corporations, educational establishments and the Government. Mr. Harbison writes on the development of human resources in the newly industrialising countries. He emphasises that the training of skilled manpower is a form of investment and is

expensive; it is in competition with investment in physical capital for the limited investable resources available. Some readers may feel that in stressing the cost obstacle to educational improvement Mr. Harbison does not quite sufficiently underline the social obstacles that are also present in backward countries.]

CHAMBERLIN (E. H.). Towards a More General Theory of Value. New York and London: Oxford University Press, 1958. 8½″. Pp. xii + 318. 40*s*.

[To be reviewed.]

CROSSER (P. K.). Economic Fictions. A critique of subjectivistic economic theory. New York: Philosophical Library (15 East 40th Street), 1957. 8½″. Pp. xxiii + 322. $4.75.

[This consists of an extended attack on a series of economists who in the author's view are guilty of the sin of economic subjectivism. The economists in question are Thuenen, Menger, Wieser, Boehm Bawerk, J. B. Clark, Jevons, Schumpeter, Keynes and Othmar Spann. The author's attack on these economists is very all-embracing, and his style, involving as it does great numbers of epigrammatic one-sentence paragraphs, is extremely obscure; but his main point seems to be that post-classical economists abandoned the empirically based generalisations which he considers to have been typical of Smith and Ricardo and substituted a system of deductive model-building based on psychological introspection, thus leading ultimately to the reign of complete irrationalism.]

DALES (J. H.). Hydroelectricity and Industrial Development, Quebec 1898–1940. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1957. 9½″. Pp. xii + 269. 45*s*.

[The greater part of this book is occupied with an elaborately detailed historical narrative of the main Quebec power companies, with special reference to their role in fostering industrial development. Many of the distinctive features of the hydro-electricity industry, especially in its earlier days, arose from the large minimum scale of operations. This made the raising of capital a major problem, and in the event a large proportion of the capital was raised in the United States. It also meant that the companies had a great incentive to seek new outlets for their power so as to make possible full capacity working. The author's conclusion substantiates the commonly held view that hydro-electric power has played a decisive part in the industrial development of Quebec.]

DIAMOND (W.). Development Banks. Baltimore, Maryland: Johns Hopkins Press for the Economic Development Institute (London: Oxford University Press), 1957. 9″. Pp. xiii + 128. 24*s*.

[The term Development Bank as used by the author includes both the nineteenth-century continental type of industrial bank and the various state-sponsored banks that have been set up in under-developed countries in recent years to foster private industry. The distinguishing feature of a Development Bank is that it not merely provides industry with finance, but also contributes to a significant degree to the supply of entrepreneurship. The author reviews the experience of such banks in advanced countries and then goes on to consider in more detail the problems of formation and operation in under-developed countries at the present time.]

Federal Lending: Its Growth and Impact. A summary prepared by the editorial staff of the National Bureau of Economic Research of a research report in the Financial Research Program. Occasional Paper 58. New York: National Bureau of Economic Research, 1957. 9″. Pp. viii + 48. $1.00.

[The report which is here summarised is the result of a major research project carried out by the National Bureau on federal government activities from 1917 to 1953 in extension of credit, guarantee and insurance of loans. The authors give particulars on the volume of this activity and its effects on economic fluctuations and on the allocation of resources. Four sectors are distinguished as beneficiaries: housing, agriculture, business and financial institutions.]

FUCHS (V. R.). The Economics of the Fur Industry. New York: Columbia University Press (London: Oxford University Press), 1957. 9″. Pp. 168. 40*s*.

[The author of this monograph is an academic economist with extensive personal experience in the fur industry. His great knowledge of the industry is in evidence throughout. He gives an analytical description of the main branches of the fur business, including estimates of the shape of cost curves in the manufacturing branch. This factual material serves as the background for his discussion of the causes and possible remedies for the two ills that have afflicted the industry in recent times: extreme short-run instability, and long-run stagnation and decline.]

GLAESER (M. G.). Public Utilities in American Capitalism. New York and London: The Macmillan Company (10 South Audley Street, London, W.1), 1957. 9½″. Pp. 634. 52*s.* 6*d.*

[To be reviewed.]

HAMMOND (B.). Banks and Politics in America, from the Revolution to the Civil War. Princeton, New Jersey: Princeton University Press, 1957 (London: Oxford University Press, 1958). 9½″. Pp. xi + 771. 100*s.*

[To be reviewed.]

HANDLER (M.). Antitrust in Perspective. The complementary roles of rule and discretion. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 8″. Pp. vi + 151. 24*s.*

[The central question discussed in these lectures is the extent to which it is the function of the judiciary to apply the discretionary canon of " reasonability " in deciding whether a given practice is or is not contrary to the anti-trust acts. The approach which Professor Handler himself believes to be most appropriate and most in keeping with the ultimate objectives of anti-trust legislation is that the judiciary should exercise discretion in deciding whether or not a given practice does or does not militate against competition, but should *not* regard it as within its competence to decide that lessening of competition, if proved, is reasonable; this latter is excluded, since the aim of the legislation is expressly to maintain competition. The principles which Professor Handler favours are in fact actually adopted by the Supreme Court at the present time in the interpretation of the Sherman Act, but a different rule, and in his view a worse one, governs the interpretation of the Clayton Act. Professor Handler suggests the same general principles should apply to the treatment of mergers, which is at present in a very confused state.]

HEATH (S.). Citadel, Market and Altar. Outline of socionomy, the new natural science of society. Baltimore, Maryland: The Science of Society Foundation (Roadsend Gardens, 1502 Montgomery Road, Elkridge 27), 1957. 9½″. Pp. xxiv + 259. $6.00.

[The author, who was born in 1876, has had a successful and varied career as an engineer and as a lawyer. He sets forth in this book a general theory of the organisation of society. The most concrete feature of the system he envisages is that many if not all of the functions of the State would be taken over by property owners as a class.]

HICKMAN (W. B.). Corporate Bonds: Quality and Investment Performance. National Bureau of Economic Research, Occasional Paper No. 59. New York: National Bureau of Economic Research 1957. 9″. Pp. x + 33. 75c.

[This is a summary of the author's forthcoming book, *Corporate Bond Quality and Investor Experience*, to be published shortly by the National Bureau. The findings include particulars on yields and losses on corporate bonds of different grades in the United States between 1900 and 1943.]

JAMIESON (S.). Industrial Relations in Canada. Ithaca, New York: Cornell University Press, 1957 (London: Oxford University Press, 1958). 8½″. Pp. viii + 144. 14*s.*

[This is the first of a projected series of studies on industrial relations in countries outside the United States. It sets a high standard of lucidity and interest. The author deals in successive chapters with the economic and social setting, the origin and growth of the Canadian labour movement, the structure and policies of Canadian unionism, and government policy—this latter chapter containing also a survey of the main issues in Canadian industrial relations since the war. Most Canadian unions are branches of " international " unions dominated by the United States membership, and the history of industrial relations in Canada reflects a mingling of influences from the United States and of such specifically Canadian factors as the predominance of agriculture, the importance of recent immigration and also of emigration to the United States, and the strength of the Catholic Church in French Canada.]

LEE (D. H. K.). Climate and Economic Development in the Tropics. New York: Harper & Brothers for the Council on Foreign Relations (London: Oxford University Press), 1957. 8½″. Pp. xviii + 182. 28*s.*

[This provides a useful brief survey of the results of much recent work by geographers and others. The author begins with a discussion of the classification of climates, with special reference to the nature of tropical climates. He then proceeds to consider the effects of climate on crop production, animal husbandry (which much of his own research has been devoted to), human health and efficiency, and industry. A concluding chapter discusses future prospects. Professor Lee suggests that the ill-effects of tropical climate as such on Man are probably less than was formerly supposed.

In the case of indigenous populations in tropical countries, poverty and disease rather than climate are the main causes of poor health and poor performance; and Europeans, even when "acclimatised," often fail to modify their way of life and social habits sufficiently radically to meet the requirements of a tropical environment.]

LIESNER (H. H.). The Import Dependence of Britain and Western Germany: A Comparative Study. Princeton Studies in International Finance, No. 7. Princeton, New Jersey: International Finance Section, Princeton University, 1957. Pp. 84.

[The author sets out to consider, mainly with reference to the period 1950–55, why it is that Western Germany's imports are so much smaller than those of Great Britain, notwithstanding that the two countries have roughly the same population and area and are at broadly similar stages of general development. He analyses in detail the two categories, food and raw materials, which between them account for by far the greater part of imports in both countries. This analysis includes much interesting and valuable information about the comparative structure of the two economies. Higher domestic production of food and raw materials and lower total consumption of them both contributed to Germany's lower import level. The author suggests that ultimately much of the explanation of the difference arises from the bias imparted to the structure of the German economy by the protectionist character of its commercial policy in the past.]

NEWMAN (J. W.). Motivation Research and Marketing Management. Boston, Mass.: Graduate School of Business Administration, Harvard University, 1957 (London: Bailey & Swinfen, 1958). 8½″. Pp. xiv + 525. 60*s*.

[The aim of this book is to show how "behavioural science," *i.e.*, analysis of why people behave as they do, can assist in the planning of advertisements and in selling generally. As usual with Harvard Business School publications, numerous entertaining examples are drawn from the results of field work.]

NEYMAN (J.) (Ed.). Proceedings of the Third Berkeley Symposium on Mathematical Statistics and Probability. Vol. V: Econometrics, Industrial Research and Psychometry. Berkeley and Los Angeles: University of California Press, 1956 (London: Cambridge University Press, 1957). 10½″. Pp. 184. 43*s*. 6*d*.

[The papers contained int his volume were delivered at Berkeley in December 1954, and July and August 1955. The four papers on Econometrics are of an extremely specialised character. The first by K. J. Arrow and L. Hurwicz is entitled Reduction of Constrained Maxima to Saddle-Point Problems, while the other three, by E. W. Barankin, C. W. Churchman and P. Suppes, are all concerned with the foundations of probability, utility and decision theory.]

NUSSBAUM (A.). A History of the Dollar. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 8″. Pp. 308. 36*s*.

[To be reviewed.]

OLIVER (H. M.). Economic Opinion and Policy in Ceylon. Durham, North Carolina: Duke University Press for the Duke University Commonwealth Studies Center (London: Cambridge University Press), 1957. 9½″. Pp. xiii + 145. $3.50.

[This book provides a brief but perfectly adequate account of Government economic policies in Ceylon from 1916 onwards. But, in spite of assiduous study of the available printed sources, its author strikes a number of false notes in trying to account for the opinions and motives behind those policies. There may be several reasons for this: an insufficiently critical approach, the unfamiliarity of an Oriental society, the interpretation of survivals of colonial methods as "interventionism," and an apparent failure to meet politicians and senior Government servants.]

PERLMAN (M.). Labor Union Theories in America. Background and development. Evanston, Illinois: Row, Peterson, 1958. 8½″. Pp. xv + 313. $6.00.

[To be reviewed.]

SAULNIER (R. J.), HALCROW (H. G.) and JACOBY (N. H.). Federal Lending and Loan Insurance. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½″. Pp. xxx + 566. 96*s*.

[To be reviewed.]

SHIOMI (S.). Japan's Finance and Taxation, 1940–1956. Translated by S. HASEGAWA. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 10″. Pp. xi + 190. 48*s*.

[To be reviewed.]

SHISKIN (J.). Electronic Computers and Business Indicators. National Bureau of Economic Research, Occasional Paper 57. New York: National Bureau of Economic Research, 1957. 9″. Pp. 48. $1.00.

[The author is chief economic statistician in the United States Bureau of the Census. He describes the ways in which the use of electronic computers makes possible the use on a large scale of techniques of eliminating seasonal and other such disturbances from statistical series and so serves to assist government and business to make well-informed and up-to-date appraisals of trends in activity. The cost of processing statistical series in this way, and so making them more intelligible, is negligible compared with the cost of collecting the raw data.]

SPULBER (N.). The Economics of Communist Eastern Europe. New York: Technology Press of the Massachusetts Institute of Technology and John Wiley (London: Chapman & Hall), 1957. 9″. Pp. xxviii + 525. 100*s*.

[To be reviewed.]

WEINTRAUB (S.). An Approach to the Theory of Income Distribution. Philadelphia, Pennsylvania: Chilton Company (London: Bailey & Swinfen), 1958. 8½″. Pp. x + 214. 52*s*.

[To be reviewed.]

WHITIN (T. M.). The Theory of Inventory Management. Second edition. Princeton, New Jersey: Princeton University Press (London: Oxford University Press), 1957. 9″. Pp. ix + 347. 52*s*.

[The first edition of this book was noticed in the ECONOMIC JOURNAL of March 1954, p. 227. The second edition includes as appendices six further articles on the subject published by the author since the first edition appeared.]

WINNICK (L.). American Housing and its Use. The demand for shelter space. In the Census Monograph Series sponsored by the Social Science Research Council in co-operation with the Bureau of the Census of the United States Department of Commerce. New York: John Wiley (London: Chapman & Hall), 1957. 9″. Pp. xiv + 143. 44*s*.

[This study is based mainly on the Census of 1950. The analysis is conducted in terms of the number of persons per room. This ratio is related to a number of variables that might be held to affect it: income, household size, rent, location and race. Trends over time are also discussed. The result is a valuable work of reference, and the many interesting findings cannot be briefly summarised. Some of the more noteworthy may be mentioned. Improvement in the housing-space standard in the United States during the last half-century has been modest: the non-farm person-per-room ratio has apparently not been reduced by more than 15–20% since 1900. The extent of under-utilisation of space caused by rent restriction appears to have been small, though not negligible. There is no evidence of any marked trend towards increased use of separate living-quarters by the elderly, though the proportion of dwellings occupied by the elderly has, of course, increased with the rise in the ratio of elderly to total population.]

Womanpower. A Statement by the National Manpower Council with chapters by the Council Staff. New York: Columbia University Press (London: Oxford University Press), 1957. 9″. Pp. xxxi + 371. 40*s*.

[To be reviewed.]

## *German*

OERTEL (R. R.). Das System der Sowjetwirtschaft. Institutionelle Faktoren, Marginalprinzip und Gleichgewicht in der Sowjetwirtschaft der stalinistischen Periode. Berlin: Duncker & Humbolt, 1957. 9″. Pp. 209. DM. 18.60.

[To be reviewed.]

RITTERSHAUSEN (H.). Bankpolitik. Frankfurt: Knapp, 1956. 8″. Pp. 222.

[The main distinction of this book on money, credit and banking is that it pursues its subject down to the level of individual firms and individual transactions. The author contends that there are credit elements in all transactions, whether by the banking system or not; secondly, he holds that the influence of the effective money supply on prices should be analysed by considering the pricing process on actual markets. In this last respect he is, by his own admission, not entirely successful. Policy is mainly represented by a preoccupation with inflation as it occurred in Germany in the early twenties, and the need to prevent similar inflationary increases in the money supply; there is, however, surprisingly little discussion of the means of credit policy and the details of central banking.]

WEBER (A.). Kurzgefasste Volkswirtschaftslehre. 7th edition. Berlin: Duncker & Humblot, 1956. 9½″. Pp. xvi + 304. DM. 14.

WEBER (A.). Kurzgefasste Volkswirtschaftspolitik. 7th edition. Berlin: Duncker & Humblot, 1957. 9½″. Pp. xii + 395. DM. 16.

[These are revised editions of two out of three companion volumes which together constitute a first course in economics, the third volume being devoted mainly to German conditions. The first book is an introduction to economic principles rather than a text-book, with more emphasis on points of view and modes of approach than on the mechanics of particular processes. The second book is more descriptive and mainly concerned with the structure of the economy and the role of various institutional arrangements rather than with short-term economic policy. Both books are classical in outlook, pre-Keynesian, orthodox and not free from dogmatism. They have been brought up to date in the sense that the theoretical developments of the last few decades are all mentioned; but in general the author does not approve of them, and on these occasions is given to polemics rather than to exposition.]

## *Swiss*

BOEHLER (E.). Nationaloekonomie—Grundlagen und Grundlehren. Zurich and St Gallen: Polygraphischer, 1957. 9½″. Pp. 289.

[But for its insistence on the metaphysics of the subject, this would be an elementary text-book of the principles of economics. As it is, the author attaches much more importance to methodological matters than is usual, and parts of the book read like a monograph on the nature, object and method of economics. In addition to this, however, it contains a straightforward exposition of some of the elements of economics. There is first a chapter on the institutional framework, followed by a discussion of economic flows, including the generation of national income, and by a chapter on money and banking. Only then is the analysis of prices and cost introduced. The book concludes with briefer notes on the distribution of income and on the trade cycle.]

BOLLIER (R. D.). Die These einer chronischen Dollarknapheit. Zurich and St Gallen: Polygraphischer, 1956. 8″. Pp. 239. Sfr. 14.50.

[This doctoral thesis reviews various arguments which have been put forward to support the view that the persistent dollar shortage may be a permanent phenomenon. It concludes that, on balance, the case against the return to equilibrium by unaided economic forces must be accepted.]

FREI (R.) (Ed.). Economic Systems of the West. Vol. 1. Basle: Kyklos; Tübingen: Mohr, 1957. 9½″. Pp. 247. DM. 22.

[This symposium had its origins in an article in *Kyklos* in which Calvin B. Hoover suggested that there was a need for a survey of the extent to which the economies of each of the countries of the West could legitimately be described in terms of a competitive model. The list of questions which he drew up in that article has been before the contributors to the present volume and has served to give their contributions the same focus. Most of the questions related to aspects of competition, monopoly and state control of industry, but more general questions about the economic activities of the State were also included, and the various authors differ somewhat in the relative amount of emphasis placed on the two aspects. The countries covered in the present volume are Belgium (by V. Janssens), Denmark (by B. Fog), Great Britain (by G. C. Allen), Japan (by Gen-ichi Abe), Holland (by C. Goedhart, J. F. Haccou, P. Hennipman and J. H. van Stuyvenberg), Austria (by W. Weber), Spain (by H. P. Eguilaz) and Sweden (by H. Hegeland). Some of the articles are in German, some in English and some in French, and summaries are provided in each language. A second volume dealing with other countries is promised.]

HAERRY (H.). Die Intensitaet des Wettbewerbs. Winterthur: Keller, 1954. 8″. Pp. 108.

[A doctoral thesis which deals with the different definitions and measures of the degree of competition (or its absence) which are current. The author's own contribution is to suggest a subjective approach in which the entrepreneur's consciousness of various threats to his profits is the decisive characteristic of the market situation.]

STOHLER (J.). Der Basler Arbeitsrappen. Zurich and St Gallen: Polygraphischer, 1957. 8¼″. Pp. 180. Sfr. 14.50.

[The title of this book refers to a programme of public expenditure adopted by the City of Basle during the pre-war depression in order to relieve local unemployment. The first half is taken up by a description of this programme, which consisted mainly in increased expenditure on building and construction, financed by a loan, which in turn was serviced by a special tax on employment

income. There follows a survey of the theory of employment and income and an outline of a corresponding model for local economic policy. The latter is, of course, similar to the usual model but for a much higher propensity to import. The presentation is noteworthy in that the author makes some attempts to arrive at specific numerical values of the coefficients for the particular case with which he is dealing.]

STUTZ (F. N.). Der Konjunkturtest. Zurich and St Gallen: Polygraphischer, 1957. 8″. Pp. 291. Sfr. 18.65.

[The greater part of this book consists of an exhaustive description of the surveys of business opinion which in recent years have been adopted by the IFO-Konjunkturinstitut in Munich and the I.N.S.E.E. in Paris. The main characteristic of these surveys is that those taking part are asked to indicate the tendency of a wide range of economic variables without, however, having to give any exact numerical information. This ensures high response rates and a rapid collection of information; more important, surveys of this type successfully probe the intentions and expectations of the business world. It is the latter property to which the author attaches most importance, and after the description of the methods used in these surveys he reviews various economic theories which have some bearing on anticipations and uncertainty. The survey data are then fitted in various ways into the slight theoretical framework which the literature yields. Finally, an attempt is made to judge the reliability of the survey results by internal evidence. The important question how this unconventional type of statistics is to be interpreted, and how it fits in with the customary aggregate characteristics, is mentioned, but it appears that the solution to it has not yet been found.]

## *Belgian*

VANDENBORRE (H. J.). De Geldkringloop in de Keynesiaanse theorie. Leuven: Ceuterick, 1956. 8″. Pp. 171.

[This doctoral thesis, entitled "Money Flows in Keynesian Theory" is a detailed critical analysis of various aspects of Keynes' "General Theory" and some of the reformulations of the central theoretical parts which have been suggested later. The author makes much of the algebra of the savings-equals-investment equation, for example, but rejects it finally mainly because paid-out income lags behind and is not necessarily equal to the value of production. The other points which he raises seem to be of the same order of importance, but the book is difficult to read, and this may conceal its real contribution. On the face of it, however, it appears to correct Keynes and later expositors of his theory on a number of minor points without adding much to economic analysis.]

## *Dutch*

CHILD (F. C.). The Theory and Practice of Exchange Control in Germany. A study of monopolistic competition in international markets. In the International Scholars Forum series. The Hague: Martinus Nijhoff (London: Batsford), 1958. 9½″. Pp. 241. 38*s*.

[To be reviewed.]

COBNENHAGEN (M. J. H.). Economische geschriften. Amsterdam: Elsevier, 1957. 10″. Pp. 605.

[A memorial volume of selected papers, posthumously collected, which are mainly concerned with philosophical and ethical considerations bearing on the nature of economics.]

HACCOÛ (J. F.). Some Fundamental Problems of Policy Formation and Organisation in the Commercial Field. Leiden: Stenfert Kroese, 1957. 9″. Pp. 53.

[The first of these two lectures deals with certain general questions of organisation in a distributive undertaking. The second lecture deals with the particular problem of what he calls the "assortment" or choice of product-mix. The author's addiction to an abstract and unspecific style of writing similar to that of some sociologists does not make for easy reading.]

HUGH-JONES (E. M.) (Ed.). Human Relations and Modern Management. Amsterdam: North-Holland Publishing Company, 1958. 9″. Pp. x + 256. Guilders 20.

[To be reviewed.]

SCHLOSS (H. H.). The Bank for International Settlements. An experiment in central bank co-operation. Amsterdam: North-Holland Publishing Company, 1958. 9″. Pp. xi + 184. Guilders 15.

[This is based on the author's doctoral thesis at Columbia University. It provides a straightforward account of the origins of the Bank, of its part in the reparations negotiations, of its functioning during the 1930s and of its revival after the War. The author has a high regard for the work of the Bank and is sympathetic to the point of view that it has represented.]

SHACKLE (G. L. S.). Time in Economics. Professor de Vries Lectures, No. 2. Amsterdam: North-Holland Publishing Company, 1958. 7½". Pp. 111. Guilders 6.50.

[To be reviewed.]

## *Japanese*

OHKAWA (K.). The Growth Rate of the Japanese Economy since 1878. Tokyo: Kinokuniya Bookstore, 1957. 8½". Pp. v + 250.

[This is an important and pioneering collection of newly estimated statistical series relevant to the study of Japanese economic development. The data given include: national income in total and in primary, secondary and tertiary industries respectively; output of leading commodities; prices; total and gainfully occupied population; and a long section on capital. The latter provides estimates of the capital stock at different dates, of the rate of capital formation and of capital-output ratios in particular sectors of the economy. The national-income data are taken back to 1878; the data on capital formation mostly start in the early years of the twentieth century. Full explanation of sources and methods of estimation are provided.]

## *Nepali*

PANT (Y. P.). Planning for Prosperity in Nepal. Kathmandu: Nepal Cultural Association, 1957. 7". Pp. 152. Nepali Rs. 2/-.

[This small book analyses the main features of Nepal's draft first five-year plan and discusses some of the problems of its future implementation. The author rightly stresses that with "scarcely any statistical data, scant financial resources and inadequate administrative personnel" the Plan will not bring miracles.]

## *Official*

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Manufacture, Distribution and Sale of Metal Culverts and Related Products. Ottawa: Department of Justice, 1957. 10". Pp. 157.

[This inquiry relates to the system of uniform pricing practised by manufacturers of metal culverts in Canada. This system is found to result from deliberate agreements between manufacturers and not from price leadership or other such cause.]

INTERNATIONAL

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT and INTERNATIONAL MONETARY FUND. Current Problems of Credit and Fiscal Policy. An informal discussion at the twelfth annual meeting of the Boards of Governors. Washington, D.C.: International Bank for Reconstruction and Development and International Monetary Fund, 1957. 11". Pp. 24.

[This contains a series of short addresses, mainly on problems of inflation, by W. M. Martin, Chairman of the Board of Governors of the Federal Reserve System, H. V. R. Iengar, Governor of the Reserve Bank of India, J. Pardo, Governor of the Bank for Peru, Sir Dennis Robertson and Per Jacobsson, Managing Director of the IMF.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Eighth Annual Report. Europe To-day and in 1960. In two volumes. Paris: O.E.E.C., 1957. 9½". Vol. I: Pp. 120; Vol. II: Pp. 152. 7*s*. each volume.

[The first volume contains a review of economic conditions and problems in Europe up to the end of 1956, including a chapter on the economic effects of the Suez crisis. The second volume gives projections of production and consumption of various classes of product in Europe in 1960. Given the maintenance of full employment and the expected growth in productivity, a rise in GNP in real terms of about 17% is forecast for the period 1956–60.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Liberalisation of Europe's Dollar Trade. Second Report, June 1957. Paris: O.E.E.C., 1957. 9½". Pp. 164. 9s.

[This contains an account of the measures taken to relax quantitative restrictions in the OEEC countries on trade and invisible transactions with the dollar area. Discussion is also included of the effects of liberalisation and its relation to the state of the balance of payments.]

UNITED NATIONS. Economic Survey of Europe in 1957, including studies of the international trade of European countries and manpower and employment in Eastern Europe and the Soviet Union. Prepared by the Research and Planning Division of the Economic Commission for Europe. Geneva: United Nations, 1958. 11". Pp. 390. 28s.

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**A Symposium**

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